The Builder.

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Provisional Amounts in Contracts.

THE paper on this subject recently read by Mr. Randall at the Institute of Builders, and of which an abstract appeared in our last (page 201, *ante*) affords a curious indication of the extent to which architecture and building, instead of representing (as they once were generally supposed to represent) the art of design and the science of construction, are more and more becoming a mere business for producing buildings, as money-earning property, in the shortest possible time and in the cheapest manner. In the system of conducting work referred to by Mr. Randall in his paper, all consideration of architecture in the true sense of the word seems to have gone to the winds. The architect is no longer a designer in the true sense, he is an agent for developing building property, a wire-puller who brings various trading firms into action for the specified end. The "builder," as he once actually was and is still by courtesy called, has become solely a "contractor" and nothing else, and knows little or nothing personally of the building he is to assist in putting together. In speaking recently of the modern position of the quantity surveyor, we referred to the extraordinary change which this system has brought about in the relation of the builder to the actual execution of the work, when, instead of studying and knowing the building which he undertakes to carry out, he sees a schedule of quantities and prices, and perhaps just glances at the drawings. This is not the principle on which to ensure the best building. But Mr. Randall's paper drew attention to the fact that the contractor on this system has not even the control of all the work supplied in his hands. A sum for instance, is specified for ironwork, but all the builder knows is that he is to unload and fix so many tons of constructional ironwork. This, again, is not the way to ensure good building. The practical director of the building should have control over the whole, and know all that is being done. The nominal "builder" has, however, nearly ceased to be the practical director of the construction. The person who is really most so at present is the clerk of works, if he is a good man with knowledge of his work and power to enforce attention. Nor is it, apparently, Mr. Randall's special complaint that the builder has not control over the details of the ironwork. It is rather that he has not control over the date of its delivery. That is obviously the essence of the grievance. The specialist who produces the ironwork has no connexion with the contractor beyond the fact that the latter has to sign the order for the delivery of the work. Beyond that, the "selected person" who supplies the ironwork is often "most independent," as we can well believe. He will only supply it in the manner and at the time convenient to himself, and the contractor experiences delay which injures him both in pocket and in reputation. The same thing is the case with terra-cotta, where the delays are even more vexatious, though as a matter of fact they are often quite unavoidable, owing to the conditions of the production of the material. Mr. Randall says that after many years' experience he can only recollect one instance in which terra-cotta was supplied to the stipulated time; which we can well believe. The terra-cotta has to be modelled from detailed drawings with an allowance for shrinkage; a kind of detail drawing which requires much care and consideration, which is not entered on till after the contract is signed, and then there is the time for modelling to be allowed, and after that all the possible delays and occasional risks in firing: so that we cannot wonder that Mr. Randall should recommend contractors to be very cautious about having anything to do with terra-cotta in cases where time is of the essence of the contract.

The suggested remedies for these difficulties are of course all made from the contractors' side of the question, but they are worth consideration by architects. The ironwork difficulty Mr. Randall considers to arise from the fact that architects do not receive the same education as an engineer in regard to ironwork, and consequently rely on the ironwork specialist to make the drawings for them. He thinks these should be made in the architect's office, so that builders when tendering can see the nature and special difficulties of the work they are undertaking. Mr. Randall evidently refers to cases where the firm who supply the ironwork make their own drawings; but that is not always the case, even when the architect himself does not make them; Mr. Randall confounds two kinds of specialist. Some architects who do not trust themselves to make their own ironwork details, when the ironwork is of an important and complicated character (as in the case of a large-span iron roof), place these in the hands of an engineer, which is quite a different thing from leaving them to the ironfounder's draughtsman. The drawings are then as available as if made in the architect's office, so that the mischief is not entirely chargeable to the architect's ignorance of iron detail (supposing that proved); it is due to the bad system of having no drawings of the ironwork prepared on the architect's responsibility, — leaving it all to be done in the ironfoundry, in fact. It is quite true that few architects have studied ironwork systematically, and it is to be regretted; but if they engage an engineer to make the details of this part of the work it is (or may be) the same thing as far as the contractor is concerned; the drawings can be seen in the architect's office, the work can be included in the quantities, and the order can go through the contractor and leave him with the control of the ironfounder, which he ought to have. The position in that case is in fact simply that the architect enters into temporary partnership with an engineer. Of course some one has to pay the consulting engineer's fee, and there is no doubt the architect ought to pay that (and generally does). It is paid for knowledge which, in these days of iron, the architect ought to have himself, and ought to supply at all events at his own cost. This consideration, however, is probably the reason why the whole thing is sometimes turned over to the founder, who will arrange the details without making a special charge for it: he is to supply so much ironwork, and does it in his own way. Apart from the question whether this is the way to get the most scientifically-designed ironwork, we quite concur with Mr. Randall that it is a system very unfair to the contractor, who has to complete the building by a specified time, and depends on the delivery of ironwork over which he has no kind of control, and of the difficulties of fixing which he knows nothing until it comes upon the ground.

Terra-cotta is rather a different matter. Terra-cotta manufacturers tell the contractor they can give him no date for delivery until they have all the details before them. Thereupon the contractor, as represented by Mr. Randall at least, thinks the architect should have all the details ready before the signing of the contract. And supposing the tenders come much higher than the building owner expects, and the building is indefinitely postponed? The architect then will have done a quantity of detail work for which according to the usual professional custom he will not be able to charge. The architect would hardly care to undertake that work at that juncture unless he first had a special understanding with his client about it. Mr. Randall has another proposition which is peculiarly a builder's view of the matter, viz., that the architect should say to the terra-cotta makers, "Here are the drawings, you know the nature of your own material best, make the working drawings and submit them for my approval." This Mr. Randall thinks is "a common-sense thing to do"; a remark which only shows how entirely incapable builders often are of understanding the true nature of architectural work. It is exactly in the refinements of detail that the true architect's hand is most distinctly shewn, and no architect who had an artist's interest in his work would listen to such a proposition for a moment. If people will build in a hurry and employ terra-cotta, the only way out of the difficulty is for the architect to say to his client, "If this work is to be carried out in the time you wish, the terra-cotta details must be prepared in advance to be ready at the signing of the contract, and in that case I must be indemnified for the work on them, in addition to the usual charge for drawings and specifications, in case of the building not being carried out." Without such an understanding the architect would run the risk of being victimised, instead of the contractor.

With much of what Mr. Randall says as to the inconvenience of specifying particular firms to do special work, and leaving them practically out of the control of the contractor, we quite agree; but the same cause, hurry in building, is at the bottom of it all. Mr. Randall thinks the architect should specify details as to warming and lighting, &c., so that they can be estimated in the quantities and carried out under the supervision of the contractor, who can then arrange the time and method of doing such work in accordance with the progress of the main building, instead of having independent firms coming in and cutting his work about just when it suits their convenience. Of course this is much more convenient for the contractor and better for the proper carrying out of the whole building; but then in these cases of building against time the architect is hurried as much as anyone else; the due consideration of such details means extra time and thought before the estimate is made and the contract is signed; and under the existing state of things all these claims really mean that the architect is to take a great deal of extra trouble to save the contractor from trouble.

The moral of the whole matter is that no really satisfactory architecture or building can be done under a system of hurry. In a great many cases, especially in London, architectural practice and building operations now mean, practically, the exploitation of buildings which are to give a money return in the shortest possible time and at the lowest possible price. The only financial argument which can be brought to bear against this (for those who will listen only to financial arguments) is, that a building on which more leisure and thought is bestowed while in construction will almost certainly be a better investment for its owner in the long run. They who make haste to be rich fall into a snare—in building as in other matters; and perhaps some day it will be discovered that to set a number of different agents to scramble a building up in a hurry, each working for his own hand, though it may answer the immediate purpose, is not the way to produce a property that will be of great ultimate value to the building owner's "heirs, executors, and assigns;" as, from a higher point of view, it is certainly not the way to produce, in the first instance, either noble architecture or sound building.

Another New London Theatre.—It is stated that still another new theatre is projected for London, the site of which is to be in Piccadilly.

THE SCIENTIFIC WORKS OF SIR WILLIAM SIEMENS.

IN the notice of Dr. Pole's "Life of Sir William Siemens," which appeared in our columns on the 10th of November last, we said little about Sir William's literary work, knowing, by an announcement made in the preface, that we should before long have an opportunity of calling attention to it more specially. The three handsome volumes which have just appeared,[*] as a sequel to the biography, give us this opportunity.

The gift of writing clearly does not always accompany scientific knowledge or technical skill; and instances are by no means uncommon where men, very eminent in certain subjects, have shown to considerable disadvantage when they have been required to write about them. This was not so with Sir William Siemens, and in the estimate of his character offered by his biographer, his ability in this respect is noticed in the following terms:—

> "He had one qualification which is not very common among hard mechanical workers, *i.e.*, considerable literary power, of which he took full advantage. He was an admirably clear writer; and, although a foreigner born, he acquired a knowledge of English, and an ability of using it, very remarkable, as is shown by the many excellent papers he contributed to the scientific societies in this country, and the many other able documents that came from his pen."

It was natural that Sir William, having taken great pains with these writings, should desire a wider circulation for them than could be obtained in the transactions of the societies they were delivered to; and, indeed, many of them were never printed at all in that way. He, therefore, in his will, expressed the wish that they should be published in a collected form. His executors have carried out this wish, entrusting the task of editing them to Mr. E. F. Bamber, who had been Sir William's secretary for the last ten years of his life. Mr. Bamber had done a somewhat similar duty in regard to the posthumous works of the late Professor Rankine, and in both cases the work has been done well.

The first thing that strikes us is the immense amount of literary matter that Sir William produced. Few people had any idea that, in the midst of such a busy life of practical work, he could have found time for such an extent of literary labour. The three volumes contain, in either written or spoken matter, no less than 175 articles, occupying 1,337 large octavo closely-printed pages. And when it is considered that most of these articles were of a nature to require considerable study, and that many had to be illustrated by elaborate drawings, which he must either have made or directed, one is amazed at the quantity of work of which he was capable.

The papers are well arranged, according to their subjects. The first volume contains those referring to Heat and Metallurgy; the second those on Electricity and miscellaneous subjects; and the third volume is devoted to Addresses and Lectures, of which there are a great many. For it must be added that Sir William Siemens was not only a clear writer, but an able speaker. Dr Pole, in his biography, says on this point:—

> "He was also a good lecturer, and his command of English was almost as perfect in speaking as in writing. The author of this memoir has frequently had occasion to notice, when hearing him speak without any preparation, that, although he had not altogether what might be called a fluent delivery, his choice of words and mode of expression were such as could hardly be improved. He would sometimes hesitate for a moment, as if at a loss for a word, but the word he chose was always the right one."

This last remark is very significant. Some one, praising Fox, complimented him on his "never being at a loss for a word." "That may be," answered he; "but my opponent is never at a loss for the *right* word." And the choice of the right word, particularly in a technical or scientific matter, argues a great deal as to the speaker's knowledge and mental power.

His first public appearance was at the Society of Arts, on May 30, 1849, when he showed and explained an "Improved Electric Telegraph," invented by his brother, Dr. Werner Siemens, of Berlin. The communication was not published, but it was entered in the minutes of the Society, and is now printed by their permission. A year later he explained, at the same place, his own new regenerative condenser, which produced such a favourable impression that the Society awarded him their gold medal.

It is interesting to note, in connexion with this, that the *last* paper printed in the series is a rough sketch written on November 8, 1883, of an address which he intended to deliver on the 21st of that month as Chairman of the Council of the same society. But when the day came, the sad announcement of his death, two days previously, had to be made.

The first paper which attracted general attention, as showing special scientific ability, was one read to the Institution of Civil Engineers, in 1852, on the "Conversion of Heat into Mechanical Effort." It discussed ably the principles of thermo-dynamics, which were but little known then, but have since played such an important part in regard to prime movers; and it defended successfully, against some strong opponents, his own views as to this novel application of heat, which afterwards proved so successful and valuable.

In 1854, he laid before the Institution of Mechanical Engineers the description of his water-meter, the first of his inventions which was a complete success, financially as well as technically. In a compact space, not much larger than a quart bottle, this little meter contained devices of wonderful ingenuity and efficiency; and indeed now, after a lapse of nearly half-a-century, it remains unaltered, as the most perfect and popular instrument of the kind known.

The first account of the regenerative furnace, which was to revolutionise the metallurgical world, was published by him in 1857. In the very outset of this paper he took great pains to attribute the invention to his brother Frederick, modestly adding, "it has been matured and variously applied by the writer within the last few months."

The first description of this furnace for the Siemens process of steel-making was read in 1868 before the Chemical Society; for he laid so much stress on the chemical aspects of the invention that he wished to get it fully discussed by the adepts he would meet there. The result, it need hardly now be said, was very favourable to him.

In 1882 he presented to the Royal Society his paper on "The Conservation of the Solar Energy." He endeavoured to show that the sun had a peculiar action by which, after the calorific energy was radiated out into space, the materials of it were gathered up and used over again. The paper was the result of great study, and made much sensation in scientific circles as a daring and clever hypothesis. The subject involved very difficult considerations, and, although the conclusion was not generally accepted, the novelty and merit of the investigation were allowed on all hands.

This was Sir William's last scientific paper of any importance. During the few months remaining of his earthly career he reverted to more practical subjects, and when seized by his last illness he was engaged in experiments tending to bring down his great furnace invention to the common uses of every-day industry; but of these, unfortunately, no records remain.

The volume of "Addresses and Lectures" contains many addresses to societies in which he filled the office of President, including that to the British Association at Southampton in 1882, and one (in French) given to the "Société des Ingénieurs Civils," in Paris, in 1881. There are, however, others of a more popular kind. He was always ready to lend his aid to institutions connected in any way with education; and many lectures and addresses given in this way have been preserved, notably one at Birmingham, republished under the title of "Science and Industry," and one under the singular but comprehensive title of "Waste" at Coventry.

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[*] "The Scientific Works of C. William Siemens, Kt., F.R.S. A Collection of Papers and Discussions." Edited by E. F. Bamber, Civil Engineer. Three vols. London: John Murray. 1889.

In 1866 he presided at a large gathering of 900 persons as an "Abschiedsfeier" to Professor Gottfried Kinkel, and his long address, given in German, manifests a good deal of sympathy and feeling, which the more formal scientific and technical writings gave no occasion for.

His last lecture, given at the Electric Exhibition, in Vienna, three months before his death, was also in German; but it does not appear to have been preserved, as it is not included in this collection.

In 1874 he delivered a lecture at the Royal Institution of Great Britain, giving a description of the large steam vessel designed by himself for laying submarine cables across the Atlantic. The fact of his having named this vessel the *Faraday*, in honour of the great man whose voice had so often resounded within those walls, gave the lecture unwonted interest, and created great enthusiasm. He gave other "Friday Evening Lectures" at this institution, when he took care to show that he had the power of presenting those pleasant, and easy, and prettily-illustrated views of scientific truth which render science so popular in that locality.

A feature has been added to these volumes which was probably not contemplated by Sir William himself,—namely, a reprint of his more important remarks made in discussions at the various scientific societies. This is an important addition, and the editor, in finding out and selecting these remarks, has done a work of great labour with good judgment. They are not only always interesting and *à propos*, but they illustrate well the character of the man. Although he spoke very often, and on all sorts of subjects, one could see his object was, never simply to assert himself, but always to add something to the knowledge of the subject in question. He had always really something to say (which is by no means a universal feature, either in scientific or general discussions), and he always said it clearly and temperately. He had often, of course, to express disagreement with the views of others, but he always did this in a way so courteous that no one could be offended or hurt at his criticisms; and when commendation was deserved he gave it not grudgingly.

In these discussions Sir William sometimes allowed himself a little departure from the orthodox severity of science, and now and then little flashes of his pleasant nature appear. In speaking of the application of steel for shipbuilding, at the Institute of Naval Architects, and comparing it with the use of the rougher material, iron, he said:—

> "If you ride a common cart-horse you may go to sleep on him, but if you are on a fine-spirited animal, all your wits must be about you, or you may be landed in a ditch. . . . Now, should we shrink from using a material because intelligence is required in working and using it? Surely that would be a very poor compliment to this age of progress!"

Referring to some chemist's criticism, he said, with very good humour:—

> "The author had attempted to find out results without the chemist; but the chemist nowadays would put his finger into everything. If we called a thing iron, the chemist would call it a mixture of iron, phosphorus, sulphur, silicon, and other earthy materials, and it was useless to try to do without him."

In a discussion at the Society of Arts on the Patent Laws, alluding to the differences of opinion that had been expressed, he said:—

> "He had been reminded of a fable that Jupiter at one time, when there were only a few people in the world, thought that as he had heard so much grumbling about the weather, he would give each of them the option of fixing his own. Accordingly, the agriculturist, the grazier, the miller, and the potter met in order to debate what weather would suit them best. The potter thought it was outrageous to have a shower nearly every day, which suited the grazier; the grazier thought a long drought, such as the agriculturist required, was most detrimental; and the miller said unless he had a deluge every week, his water-power could not be kept up. The case before them was almost parallel to this."

In 1882, when the military objections to the Channel Tunnel were under discussion, Dr. Siemens suggested a safety-measure for suffocating the French troops with a sudden irruption of carbonic acid gas. On this, Professor Tyndall wrote to the *Times* pledging his word that Dr. Siemens could in a few minutes show half a dozen ways in which his proposed asphyxiation might be comfortably evaded. Dr. Siemens's reply, written in perfect good temper, is given in these volumes; but the little skirmish of the two great scientists added something to the fun of the tunnel-joke generally.

We must say, in conclusion, that, although many of the essays and discussions in these volumes treat of matters that were passing at the time, yet, as they refer largely to inventions and operations the effects of which still remain, they have a historical interest; and, indeed, many of the facts stated and opinions expressed are of permanent value. This is enhanced by a carefully-prepared indexing that renders reference to them easy; and, in any case, the collection, combined with the biography previously published, will form for posterity a fitting memorial of an eminent and worthy man.

NOTES.

THE sudden demise of the Metropolitan Board of Works, ten days before "the appointed day" for its natural death, will cause little surprise and less regret. We commented last week on the tone of the answer given in the House of Lords by the late Board's Chairman, Lord Magheramorne, when questioned about some of the Board's proceedings. The same magnificent tone was adopted by the Board's spokesman in the House of Commons, the Hon. Alan de Tatton Egerton, who said that "the attitude of the Board" in regard to certain matters was that "it would do its duty." It was evident when the Board met on Friday in last week that the majority meant to assert their authority, which, brief as would otherwise have been its duration, has been met with untimely abbreviation, or rather extinction. At the last moment, the Board determined to pose as the friend of the "long-suffering people of the East-end of London," and there were present a couple of deputations from the local vestries who urged the Board to "keep its memory green" by entering upon the work of constructing the Blackwall Tunnel, undeterred by the wishes of its successors, or of the Local Government Board, as conveyed in letters read from Lord Rosebery and Mr. Ritchie respectively. After much discussion, in the course of which one member (Mr. Selway) said that the Metropolitan Board was not to be "intimidated" by the Local Government Board, and another (Mr. Lindsay) that the Board was not going to be dictated to by "a licentious Press," it was resolved to open the tenders. They were only three in number, and were for the construction of the preliminary part only of the Blackwall Tunnel scheme viz., for "the footway tunnel of cast-iron, lined with brickwork," the whole scheme including two other and larger tunnels for vehicular traffic going north and south respectively. For this footway tunnel the tenders were—

Kirk & Randall	£348,212. 3s.
Webster	327,745. 0
Pearson	318,840. 0

A motion that the consideration of the tenders should be adjourned for a month was lost. After some further discussion,—in the course of which the Engineer (Sir Joseph Bazalgette) stated, in reply to a question put to him by the Chairman, that his estimate for this footway tunnel was 280,000*l.*,—though that sum did not include anything for contractors' risks in carrying out the work, the tunnelled portion of which was to be executed under compressed air,—the Board decided to accept Mr. Pearson's tender, "subject to the usual conditions and inquiries." In the ordinary course the contract would have come up before the Board for sealing this week; but, as the London County Council declined to be committed in this way to a scheme which they had had no chance of considering, and which not only involved a heavy expenditure, but would have to be carried out under the direction of an engineer other than the one who was responsible for the scheme (Sir Joseph Bazalgette retiring from the public service on the 25th inst.), they invoked the aid of the Local Government Board, who, under the powers of the Local Government Act, were able to issue an order on Tuesday to the effect that the "appointed day" for the London County Council to take over the work of the Metropolitan Board should be altered from April 1 to March 21. This was the death-warrant of the Board, which has now passed away for ever, once more illustrating the lesson that "pride goeth before destruction, and a haughty spirit before a fall."

THE President of the Board of Trade has, it appears, been in communication with the Chairman of the Railway Companies' Association with respect to the increase in railway rates reported to have followed the passing of the new Act, and has made a statement in the House of Commons on the subject. We are thus put in possession of the official version of the matter, which is briefly as follows:—Considerable alterations were made in the rates at the close of last year in view of the probable operation of the Act,—alterations, it is hardly necessary to say, which effected an increase in the charges (chiefly by the withdrawal of special rates). Since January 1, however, the companies have made no advance upon their rates, and have no intention of so doing without giving the required notice. Although the Act was passed in August last, it did not come into force until Jan. 1, so that the advances complained of were really made before it came into operation. It is further explained that if any rates have been charged exceeding those in force on Jan. 1, such advances have been made through inadvertence, and any persons so charged will have things rectified on communicating with the General Managers. We believe it is also the fact that some of the cancelled special rates have since been reinstated, but the questions asked in the House prove that much alarm has been occasioned by their withdrawal. With regard to the revised classifications and schedules, there is a growing opinion that the time allowed for making objections is too short, and it has been stated on good authority that it will probably be extended by two months. The objections will certainly be very numerous, for some of the proposals really seem to invite them. Others, on the contrary, are, in the main, not unreasonable; for we must not lose sight of the fact that, being tied to a maximum charge, the companies are bound to reserve a margin for contingencies, and the sooner their position in this respect is more generally recognised the better it will be for all concerned. The companies cannot be expected to acquiesce in the proposition (which some people seem ready to make), that they shall never, under any circumstances, be allowed to charge more for carriage than they happen to be charging at the present time; for it is certain that the highest prices are not just now ruling in regard to labour and various commodities. We presume they have no intention of forthwith re-arranging all their rates on the "pound of flesh" principle, and valid objections to their proposals will only lie where they would exceed their present powers, or where, after allowing a moderate margin, they are still obviously unreasonable.

THE proposal to establish a compulsory weekly half-holiday by statute appears to be an extreme step in grandmotherly legislation. There is a good deal to be said for the four whole-day Bank Holidays, though it were to be wished that the two spring ones were permanently fixed, and did not fluctuate according to the falling of Eastertide. But a compulsory weekly half-holiday is a very different matter. One great objection to it is that it would deprive the half-holiday which large numbers already obtain of some of its advantages. There is also to be borne in mind the fact that it is by no means an unmixed benefit or pleasure in all weathers and all seasons of the year to have a half-holiday, if there is no pleasurable or useful way of spending it; moreover, a weekly half-holiday already practically exists, and to a reasonable extent. To extend it further by legislation is at once an unnecessary step, as well as one of very doubtful general benefit.

THE reredos at St. Albans, as our readers will remember, has been restored at the cost of Mr. H. Hucks Gibbs, under the direction of Mr. Blomfield, the sculpture being executed by Mr. Harry Hems. Mr. Gibbs has applied for a faculty to authorise him to restore the Lady Chapel and ante-Chapel, the real object being, we presume, to keep Lord Grimthorpe out of it. Lord Grimthorpe has some time since deformed the south transept with his detestable railway-station Gothic, and the north transept, under the same cultured direction, is, we are informed, nearly completed. This latter part of the work we have not seen; but if it is a worthy companion to the south transept there must be a striking spectacle to the architectural mind by this time. Lord Grimthorpe, it has been for some time understood, now wishes to try his 'prentice hand on the Lady Chapel, and with the view of saving it at least from such maltreatment as the rest of the building has undergone, the attempt has been made to attack Lord Grimthorpe's legal position. His claim, we understand, is that his "faculty" gave him the whole Abbey to do what he liked with. His opponents are taking the ground that the Lady Chapel is a distinct building, and is not included in the faculty. We should doubt whether they will make this out, though every cultivated person must wish them success, as of course any appeal to Lord Grimthorpe's taste or culture is useless, and the success of Mr. Gibbs would at all events mean that if anything is done to the Lady Chapel, it will be done under competent architectural guidance. To appreciate fully the state of the case, it should be remembered that (as reported some years ago in our columns) the permission to do whatever he chose with this great archæological monument was granted to Lord Grimthorpe on the exhibition of a design (called his own) to a Chancellor who ostentatiously stated at the time that he was so entirely without knowledge of architecture that he could not even understand what a drawing meant, and it was no use showing him one. The manner in which such a power was granted to an incapable person to disfigure a great national building according to his pleasure, and the manner in which this power has been made use of, form an instance of indifference and stupidity in regard to architecture and to the treatment of ancient buildings such as we should probably find no parallel to in any other civilised country.

RATHER more than four years ago we adverted* to a formulated proposal for changing the thoroughfare of the Strand between the Royal Courts of Justice and Somerset House. That scheme was advocated by the "Strand Improvement Association." The design, as illustrated in our columns of December 26, 1885, from Mr. W. H. Brewer's drawing, contemplated the substitution of a crescent over the site of Holywell-street, and the re-erection of Temple Bar (now, however, permanently set up at Sir Henry B. Meux's seat, Theobalds, by Waltham Cross) at a spot westward of St. Clement Danes Church, and about south of the present entrance into New Inn out of Wych-street. We commented upon what clearly is the relief most needed; that is, a fresh approach to the new Law Courts from High Holborn. For a scheme in that direction we may refer our readers to a plan proposed by Mr. Chas. Forster Hayward, F.S.A., architect and District Surveyor, which we printed on November 18, 1882. The leading feature of Mr. Hayward's plan is a circus on the site of Clare Market, with three wide streets therefrom, leading respectively to Little Queen-street, Newcastle-street, and by the side of King's College Hospital to St. Clement Danes Church. We now find that another committee is formed, under the style of the "Strand Highway Improvement Association," for presenting a petition,—at present in circulation,—to the London County Council in favour of altering the roadway between the two points above-named. In October, 1887, the late Metropolitan Board of Works unanimously decided not to accede to the terms of a memorial for removing the church of St. Mary-le-Strand. The former "Association" above referred to, desired to save the church, but as we see that the petition circulated by the "Strand Highway Improvement Association," which specially demands the removal of the church, is signed by the same gentleman, if we remember right, who was secretary of the previous Association, we presume some of these gentlemen have changed their minds. They demand also the removal of the Holywell-street houses; and if that were done, the two churches, with a garden between them, and the roadway on either side of them, would combine to form a noble effect, as we have over and over again pointed out. But the middle-class English mind is so contemptuously opposed to all considerations of architectural beauty in a city that we believe many persons would feel a satisfaction in getting St. Mary's removed if it were only to show their contempt for "sentiment." If they succeed in getting their way, they will have the responsibility of having permanently destroyed the picturesque character of this corner of London.

IN Committee on Supply on Wednesday, some questions were asked of the First Commissioner of Works in regard to public buildings, especially as to the time when the new Admiralty Offices, or the new work in connection with them, we should rather say, would be finished. From the reply to this we learn that there has been unexpected difficulty with the foundations. The point that struck us most in the conversation, however, was the remark of one member in regard to the steps that have been projected into Westminster Hall:—

> "Mr. J. Ellis said he stood aghast when he saw the new steps which had been placed in Westminster Hall, and regarded them as having defaced that historic building. (Hear, hear.)"

We have over and over again repeated that when Parliament and the public found out the real effect of this "restoration" on Westminster Hall they would be indignant; now they are beginning to find out when it is too late, as we knew they would. Mr. Ellis and other members might have found this out long ago if they had listened to those who could give them correct information. Mr. Plunket said the steps had been carried out "in pursuance of the decision come to by the Committee of that House." Just so: of a Committee consisting of a majority of ignorant persons consistently opposed by the small minority who knew anything of architecture, and whose report remains a monument of architectural absurdity and folly.

IN the case of "The School Board for London *v.* Northcroft Son & Neighbour and others," Mr. Justice A. L. Smith has decided that the plaintiffs had no claim to demand the giving up of the defendant's vouchers, accounts, and documents, in order to be used for the Board's own purposes. The plaintiffs had taken out quantities in the usual way for two schools, concerning which, after the buildings were completed, the Board were not satisfied, and ordered an inquiry to be made, and the Board's solicitors wrote to the defendants to send them all the documents they had in relation to these schools. They refused, on the ground that such documents were their private property, used in arriving at their results. The learned judge said "The action is one of detinue, and there is a claim for 38*l.* for work done by Mr. Rickman in remeasuring the schools. But an action of detinue will not lie, for how can the defendants' private memoranda be the property of the plaintiffs? The ink, paper, and brains used in making them are all the defendants', and they are right in law in refusing to give them up. It has been argued that it is a breach of duty on the part of the quantity surveyor to refuse to give up his memoranda to his principal for purposes of measurement; but that is exactly what the plaintiffs have not required them for, but they wanted the documents in order to make a case against the defendants." This, as will be seen at once, is a judgment which may be of considerable importance to surveyors as a precedent. It appears that the School Board, in the course of their inquiry, discovered an error in excess in the quantities, amounting to 677 cubic yards (of what material the law reports in the daily papers do not say), for which payment had been made to the contractor. As the contractor admitted the error and (very honourably) returned the money, this dispute was practically settled; otherwise, the learned judge said, it was for the plaintiffs to make out the case against the surveyor, and it was not suggested that the mistake was anything more than a clerical error. If that means a mistake in copying, not in calculating, of course that puts it on a very different footing. Still, 677 cubic yards is an error of some magnitude, in some classes of work at all events.

AT the last, and what proved to be the final, meeting of the Metropolitan Board of Works, on the 15th inst., it was resolved, on the recommendation of the Works Committee, that from and after the 25th of March (on which day Sir Joseph Bazalgette will retire), "and until further order of the Board or their successors," Mr. Edward Bazalgette be authorised to act as Engineer *ad interim*. We do not know what the London County Council is doing with regard to permanently filling-up the office, which is one that ought to attract good candidates. Mr. J. Gordon, the present Borough Surveyor of Leicester, has already expressed his determination to come forward at the proper time. The only other name we have heard mentioned in connexion with the appointment is that of Mr. Clement Dunscombe, the City Engineer of Liverpool, but we do not know whether he is likely to be a candidate for the office.

AS usual at the Institute of Water Colours, quantity of drawings is quite disproportioned to quality, and productions by members of the Institute are hung on the line which in themselves are enough to lower the status of the exhibition. Look, for instance, at such a piece of drawing-master's effect as "Sunset on the Llugwy" (47), by Mr. P. Mitchell, or M. Jules Lessore's "Edinburgh Castle from the Calton Hill" (100), which shows an ignorance of the most ordinary problems of perspective; the imitation Lysicrates monument in the foreground is all out of drawing, and the artist apparently does not know how to treat the perspective of a landscape when seen from a height, and calls this a view from the Calton Hill, when, in fact, it is a view from a level, or nearly so, with a low horizon. The President's painting seems to come more and more to the mere fine execution of rich costumes exhibited on a lay figure, for really his "Beppina" (323) is nothing more than this. Among the architectural disabilities is Mr. Medlycott's "Vauxhall Bridge" (397), in which the bridge is most feebly drawn. On the other hand, we have Mr. Fulleylove's admirable view in the High-street, Oxford (337), and Mr. Yeend King's "Water Bridge, Newbury" (116), as well-treated architectural subjects; also, in a more picturesque and less professedly architectural manner, Mr. Holloway's "King's Lynn" (13), a fine and important work, and Mr. Newton Benett's small and delicately-executed view in "Sandwich" (79), which deserved better than to be put down on the floor. Among the more important figure subjects are Mr. Dadd's "Between Ourselves" (119), a highly-finished little painting of two old men in conversation over their wine, figures and faces expressing real character and not mere execution; Mr. Walter Langley's "Oh! for the Touch of a Vanished Hand" (123), a work of great feeling and beauty in every part; Mr. C. Green's "Mr. Mantalini and the Brokers" (409), a capital transcript of Dickens (why does not this artist try his hand also at Thackeray, who has been so little and so inadequately illustrated?); Mr. Dollman's "The Health of the Bride" (464), horses and postilions at the door of a mansion,—the same artist's single-figure picture, "Something Wrong" (48), should not be overlooked; Mr. Frank Dadd's "Cornered" (477) a large and clever work with many figures, but which tells no distinct story; and Mr. Henry Stock's two allegorical or visionary works, "Immortality's Sunrise" (590) and "A Musician's Fancies" (807). Among landscapes one of the most remarkable is Mr. Arthur Severn's "Sailing into Venice by Moonlight" (776), which is wonderfully successful in pourtraying an effect almost impossible to give by mere pigments. Mr. Bernard Evans's "Knaresborough" (195), though there is too much striving after "effects" in it (as the white church tower against a dark cloud), is a grand tumultuous kind of landscape, with a great impression of air and light about it, and a very fine sky. Mr. Alfred East's landscapes are distinctly and strikingly original; "Wind and Rain" (416) is admirable in conveying the impression intended, also "Waking of the Day" (721). Among others are Mr. Knight's fine though mannered work, "A Moorland Road" (74); Mr. Thos. Pyne's "The Black Rabbit, near Arundel" (23); Mr. Arthur Severn's "Amiens" (85); Mr. R. W. Allan's "A Breezy Day in Arran" (128), which thoroughly answers to its title; Mr. Fraser's "A Lame Duck in the Channel" (237), a ship the worse for weather getting along under a scratch rig,—a remarkable piece of colour, with the almost blue tone of the hull in shadow and the cold grey-green of the water, which latter seems hardly natural, though the sea is admirably drawn; Mr. Jas. Orrock's "Naworth" (527): Mr. Lucas's "The Cheering Harvest Waves in Gold" (594) also rather overdone in effect, but fine notwithstanding; Mr. Collier's "Cutting Gorse" (327) and "Moor and Mountain" (448). Architects should look at Mr. Cipriani's "Ruins of Rome" (551), part of the Forum seen between two columns in the foreground,—an admirable representation of ancient architectural fragments.

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* *The Builder*, January 17, 1885.

THE best picture in the exhibition at Mr. Wallis's Gallery is Professor Holmberg's "Musicians at Fault—the Lost Chord" (67), a very sumptuous and brilliantly painted Louis Quatorze interior with three ecclesiastical figures, two with a violin and violoncello; one of them pauses, pointing with his bow to the music before him. The head of this figure is very noble in character, and the whole work, both in feeling and execution, belongs to a high order of painting. J. V. Krämer's large painting of the "Descent from the Cross" (105) is an academical picture, hard in texture, crude in colour, and the dead body taken from the cross does not hang in the arms of the bearers as a dead body would; it is as if carved out of wood. The best part of the picture, the only really interesting part, lies in the figures and expression of the three Marys, which are finely contrasted: the drawing is excellent throughout, but the picture is in the main uninteresting and lifeless. There is a great deal of beauty in the indoor scene by Walther Firle, called "Needlework" (74); there is rather too much white in the picture, but the attitudes and character of the three women are carefully studied, and the little child seated on the floor is admirable. Mrs. Benham Hay's large semi-decorative painting of "A Florentine Procession" (93) for the burning of mundane vanities (under the influence of Savonarola's preaching) is an excellent and carefully-painted study of ancient costume and accessories, but a very hard picture, and one in which we cannot feel much interest, in spite of the great talent it exhibits. A small Meissonnier, "Le Rieur" (64), is a painting of a man in the act of laughing—always a doubtful subject for painting; it is painted with the artist's usual finish and power, but will not rank as one of his most agreeable works. A considerable portion of the walls is occupied by small sketches and studies by Heffner, and as the gallery contains a large-size completed work in this artist's usual style, the cult of Heffner,—a very mannered artist with all his power of effect of a kind,—seems rather too pronounced. The exhibition includes one or two small works by Israels, others by Seiler, Bertrand, and other well-known names, one or two little works by Corot and Daubigny, some admirable donkeys by De Haas, &c.; but we do not find it up to its usual level of interest. The first-named painting by Professor Holmberg is, however, worth going to see for itself alone.

THE *Pall Mall Gazette* prints the opinions of various tradesmen in the Strand as to Strand improvements, as if the architectural arrangement of London were to be settled by the opinions of the shopkeepers of this or that neighbourhood. Of course, most of these gentlemen would delight in pulling down St. Mary's. We have pleasure in recording that one of those interrogated showed more sense of the fitness of things. This was Mr. Coombes, picture dealer, 331, Strand, whose reply was, "Take away the Wych-street and Holywell-street blocks, make a good roadway to the north and south of the churches, and leave them standing. I do not see the necessity for pulling them down, and if they stood in a good wide thoroughfare I think they would be ornaments." Probably Mr. Coombes's avocation has led him to have some regard for the artistic aspect of things, which to the average tradesman is vanity.

ONE of the scenes in the setting of the "Merry Wives of Windsor," now running at the Haymarket, contains a curious mistake, which shows the importance of the scenic artist attending to all the circumstances of the scene he is to illustrate. In the scene where Falstaff announces to "Master Brook" his intention of risking a second visit to Mrs. Ford, he observes that he has an appointment between eight and nine that morning (in those happy days people breakfasted at half-past six in the morning), whereupon Ford says "'Tis past eight already." But at this time, just after eight in the morning, the sunlight is throwing the shadow from the window-head down the jamb of the window at an angle of 75 deg. or thereabouts, so that the sun must be as high in the sky as if midday were the time intended. This oversight in solar chronography should be corrected: "a little charge will do it."

The Monument to General Grant.—Some four years ago, it may be remembered, a subscription was opened in New York for erecting a monument to General Grant in that city. The designs for the same were accepted, the cost being estimated at 500,000 dols. However, up to the present time only 130,000 dols. have been subscribed, and now the donors either demand a statue for their money or to have their subscriptions returned. The monument committee has, therefore, decided to begin the erection of the monument, in the hope that when people see it in progress, funds will come in, and if this should not be the case, that the civic authorities will finish it, rather than permit a monument to remain in a half-finished state.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

ENGLISH AND CONTINENTAL DOORS.

THE sixth and last* of the present series of lectures at Carpenters' Hall, on subjects connected with the building trades, was delivered by Mr. Thomas Blashill, F.R.I.B.A., Superintending Architect of Metropolitan Buildings, on the 13th inst., as briefly mentioned by us last week. Mr. Blashill said:—

Being once more invited by this Worshipful Company to address an audience of practical men, I could think of no better subject than The Door. It is a subject somewhat neglected in England, and a useful hour may be spent in comparing foreign notions of design and workmanship with our own.

As all modern design is founded upon ancient examples, we will devote a few minutes to those standards of excellence which time has spared, or which poets and historians have described for our information and delight.

From the earliest times the doorway has been treated as the most important feature in the exterior view of a building. Beautiful design, costly materials, exquisite workmanship, have been lavished upon it. It has been made interesting by every means that art can devise. I will quote one word-picture of a doorway, because, amongst ancient writings, it is the oldest, the finest, and the most familiar. Homer tells ("Odyssey," Book vii.) how Ulysses, approaching a certain palace, stood admiring before the brazen threshold. It was like the shining of the sun or moon through the lofty-roofed house. Golden doors closed the entrance. The pillars of the jambs were of silver, carrying the silver lintel. Of gold was the ring that moved or fastened the door.

To come down to dry history, in the Temple built by Solomon the doors were of fir, hung, folding, to posts of olive-wood; they were carved with cherubims, palm-leaves, and open flowers, and were covered with gold, fitted upon the carved work. In the East, whence such gorgeous ideas have come, remains of wooden doors have been found that were covered with plates of bronze, adorned with scenes illustrative of the conquests and the triumphs of the kings. The Romans used in their doors such woods as cedar, cypress, elm, and oak, and,—of more precious materials,—iron, bronze, ivory, and gold; but not silver, as it seems. One rich Roman was reproached for being the first to use dressings of Numidian marble in his doorway; another for having bronze jambs to his porch. The doors of the temple of Minerva at Syracuse were finished with gold and ivory, ornamented with heavy golden knobs and with historical subjects most elaborately wrought. St. John the Divine tells of a city whose walls were ornamented with all manner of precious stones, every gate or portal being of one pearl. In the Pantheon at Rome the ancient bronze doors, cast in thin plates, still turn upon their pivots, after nineteen hundred years. They are adorned with rosettes and studs, and measure 14 ft. wide by 24 ft. high. The bronze doors from the Senate House at Rome, now in San Giovanni in Laterano (see illustration), measure 15 ft. by 29 ft. high, and are richly ornamented with stars and studs, and foliage. The bronze doors now in the Church of SS. Cosmo and Damiano at Rome (see illustration) are framed with stiles and panels, and moulded with ogees and enriched beads. Indeed, all these bronze doors clearly indicate a knowledge of wooden construction, which was imitated not only in bronze, but also in stone and marble. The temple of Diana at Ephesus had doors of cypress-wood, that were said to be uninjured by exposure after four hundred years. But of far more value than costly material is the art of the skilled workman. In the Church of Sta. Sabina at Rome there are now doors of olive-wood perhaps a thousand years old. They are boldly carved with scenes from scripture-history, fairly well preserved. The Church of San Zenone, at Verona, in North Italy, has wooden doors of the twelfth century, on which are nailed bronze plates, adorned with figures of a like kind. I exhibit a photograph of twelfth-century bronze doors, from the Cathedral of Pisa.

It is hardly possible to do more than refer to illustrations of the doors of the Mediæval or Gothic period of European art. They were often, in the earlier times, covered with plain, upright boarding, nailed on ledges, the hinges being developed into the most intricate and beautiful patterns that the smith could execute. Sometimes the boarding was made to alternate, one board being plain and the next moulded. Later, they were framed in designs similar to those of the contemporary window-tracery, or carved with figure-subjects. I show one such composition from the Cathedral of Burgos, in Spain. But the magnificent brass gates or doors of Henry VII.'s Chapel must not be forgotten. They are of wood, skeleton framed, and covered with elaborately-ornamented castings, which were gilded, as bronze appears to have generally been treated at all periods.

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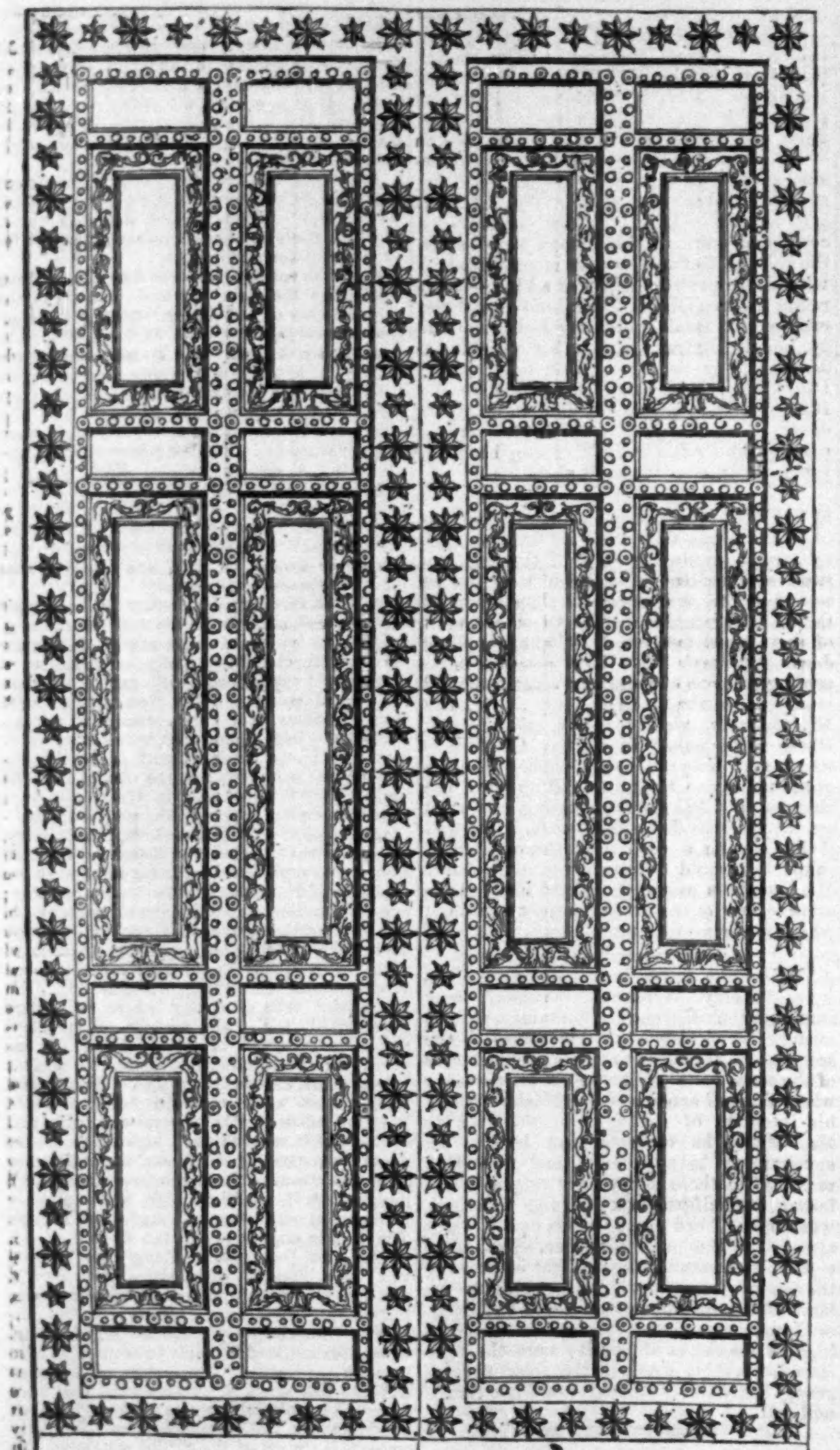
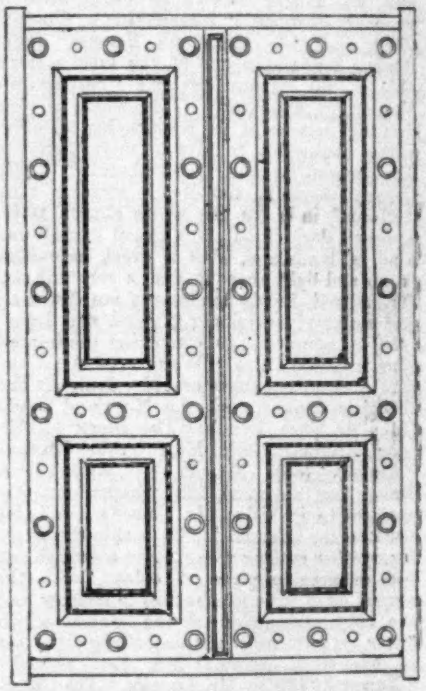
* For reports of the previous lectures, see *Builder*, pp. 109, 127, 148, 185, 205, *ante*.



Door of San Giovanni in Laterano, Rome.

The Baptistery at Florence was provided with doors that still exist. One pair, finished [in 1330, is adorned with panels containing Scripture subjects. But those made by Lorenzo Ghiberti, a hundred years later, are the glory of Italian art, and were said by Michelangelo to be fit for the gates of Paradise. A copy of these doors, gilded as they were originally, is set up in the South Kensington Museum, and bits of the ornamentation are used as models for students in all our schools of art. In the same museum are also casts of the wooden doors from St. Maclou at Rouen, made in the middle of the sixteenth century, and covered with an abundance of figure sculpture characteristic of that period of the Renaissance. I exhibit a view of a pair of doors from the Loggia of the Vatican at Rome, executed early in the sixteenth century, and quite in the taste that now prevails on the Continent. In the centre of each is a great circle surrounding a lion's head holding a ring. Above and below is a panel, and the whole is covered with ornament in relief.

These old examples illustrate nearly all the points that we shall have to consider in relation to the modern door. Practically, the modern door is, with rare exceptions, a construction of stiles, rails, and panels. Some doors in the Church of St. Sauveur at Bruges, dated 1544, but looking much later, are an early instance of the modern type; each is divided, vertically by a muntin, and horizontally by two rails, into six equal moulded panels, each panel having a moulded sinking filled with carved ornament. Le Pautre published in 1654 many examples of highly-enriched internal doors, single and folding, each being of two or three panels variously proportioned. Observe that there is no muntin in any of these doors, the general design corresponding with the French doors of to-day. The bronze doors taken from the Senate House at Rome, which have muntins, illustrate the former method; and those of the Pantheon and the Church of SS. Cosmo and Damiano, which have no muntins, illustrate the latter. We shall see the importance of this distinction. Le Pautre's designs were made at the commencement of the reign of Louis XIV. That, and the reign of Louis XV., must have been the golden age of joiners and decorators. France, and all the countries under its influence, became impoverished by the erection of ruinous palaces and princely mansions, too grand for habitation. The time of Louis XV. was marked by a profuse use of carved or moulded ornament in the shape of scrolls and shells, arranged in wildly-distorted patterns. I exhibit a drawing taken from a modern example, as the best I have at hand.

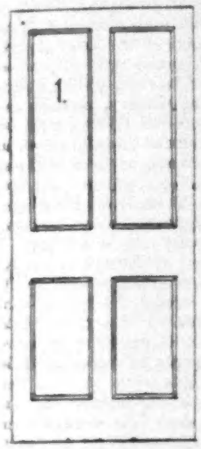


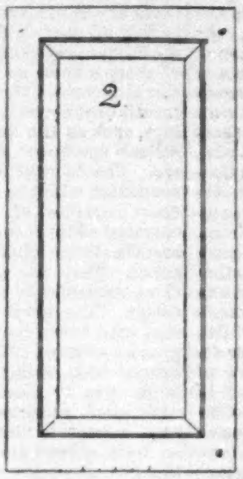
Door, Church of SS. Cosmo and Damiano, Rome.

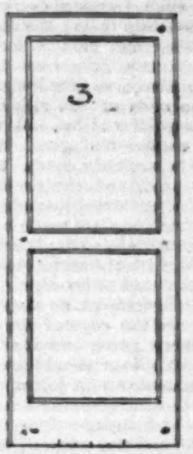
England did not escape the mania, but was less affected than other countries. Very many of the grand mansions referred to have been destroyed or abandoned. I have walked through others fitted up with joinery like this that are empty, or used to store farm produce. I know a French village every cottage in which has a Louis XV. door despoiled from some such mansions.

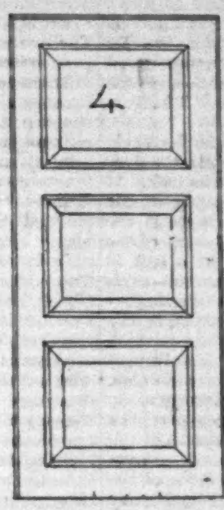
With the present century came in a taste for pure Classical architecture, that, in spite of the Gothic revival, has continued to this day. The doors of which our modern houses furnish examples are generally adapted from Classical models that are distinguished by correctness of taste, and by an absence of any quality that might make them interesting. The critic can find no fault with them, the artist can take no pleasure in them, nor can the ordinary human being enjoy an honest laugh at them. We may, at least, use them as a foundation for the study of door-construction in its simplest form, and as a means of contrasting Continental notions of joinery with our own.

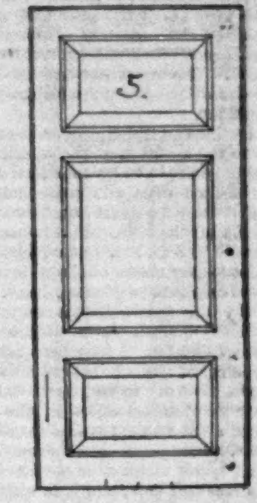
It would be possible for a traveller to make a fair guess as to the country in which he was lodged by an inspection of the joinery and ironmongery of the door of his room; but the influence of France and Italy in all the adjacent countries has caused certain common characteristics in Continental doors that distinguish them from those on this side of the Channel. A good ordinary English internal door finishes not less than 1¾ in. thick; a Continental door, though probably 6 in. to 12 in. higher, and perhaps wider, is seldom more than 1½ in., sometimes as little as an inch. As the most striking distinction, the ordinary English door has always a muntin down the middle (fig. 1), the Continental one never,—unless under the influence of English fashion, or to imitate a pair of folding-doors. I once saw a very old specimen of a door with a muntin, preserved in a Dutch museum. As the effect of this is to make the panel more than double the width of ours, we will begin with the consideration of the panel. The English joiner of to-day seems to be afraid of a panel more than 18 in. wide, and prefers to keep it less than 12 in.; but in old English work the panels of doors and wainscotting are often as wide as those we find abroad. It is an exceedingly rare thing to find these wide panels split, or even showing the joints, of which there must be two or three in each. Our good ordinary English doors have flat panels; the Continental panel is always raised on one side, or both: indeed, with such thin doors, this is necessary, in order to gain sufficient strength. Even so the thickness of the panel will be less than ½ in. We may say generally (though I do not know why) that doors of narrow panels are made thick, while those of wide panels are made thin. Early in the last century the foreign fashion of wide panels prevailed in England for a time. My example from Hereford, with two wide panels, is only 1 in. thick. I lately found a door at Roehampton of similar date, but of six narrow panels; it is 2¼ in. thick, the panel (raised on one side) being 1¾ in. Graining is not very common abroad, white or pale tints being preferred. When the painter has to grain oak on one of these fine panels, say 2 ft. 3 in. wide, his pattern is not wide enough to extend across it. He therefore draws a pencil-line down the panel, a good deal out of the middle, and stops his pattern against that, so as to produce conscientiously the effects of the joint which he knows must exist, though the joiner has care-

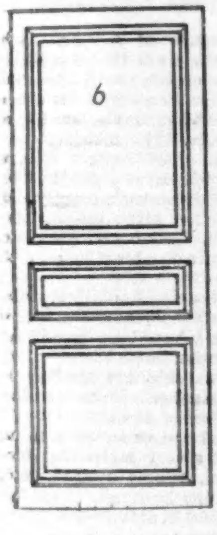


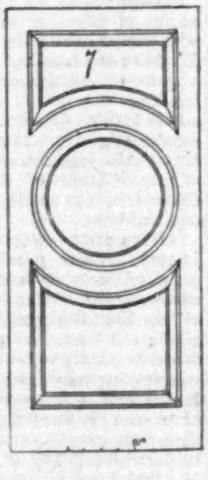


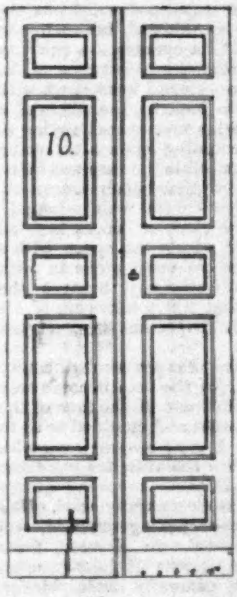


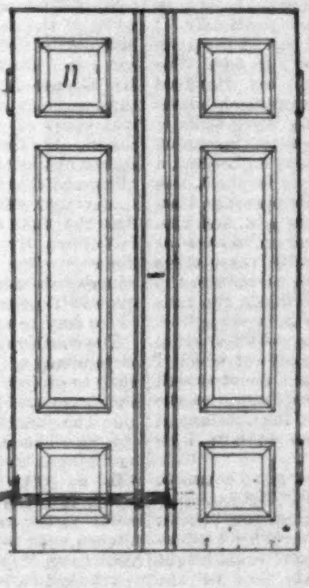


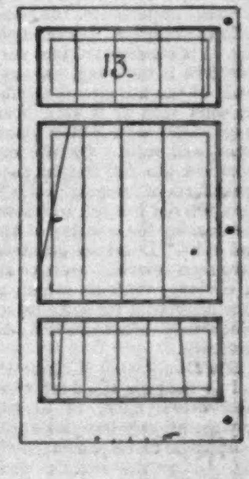


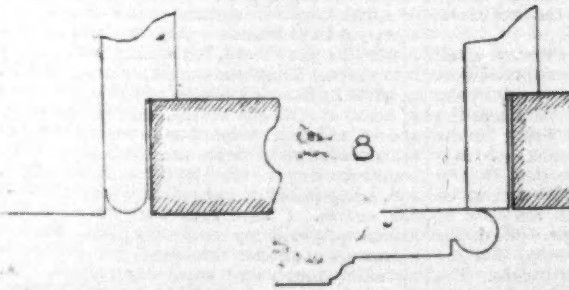


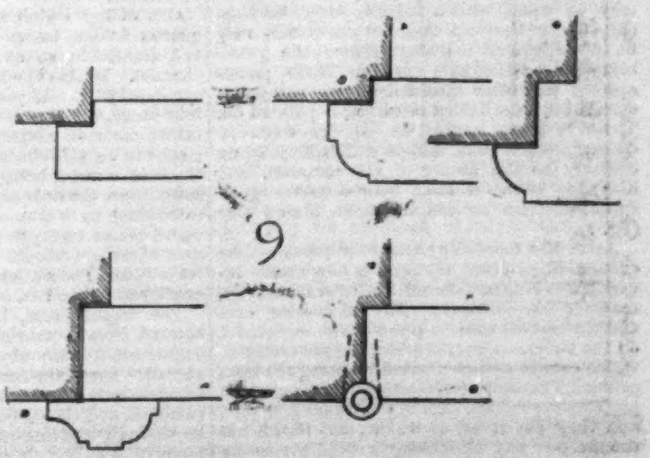


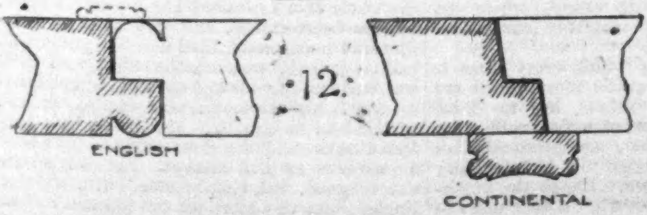












fully concealed it! The "rising" on the panel is often produced simply by reducing the margin by a full ¼ in. for a width of 1½ in. or 2 in. If raised on one side only, the painter will often show his sense of fitness by imitating a bevelled rising on the other side. The bevelled rising itself is also common.

The normal English door has four panels; sixty years ago six panels were more common. The position of the principal rail in the door is fixed by the necessity of providing for the lock. An English lock is actuated by a smooth round knob. The most convenient height at which the hand can grasp such a knob is 3 ft. 3 in. from the floor.

In the Continental door there is no fixed rule as to the position of the dividing rails, the door being too thin to be morticed for the lock. If a rim-lock does not come conveniently at the rail it must be made short enough to fix in the width of the stile. The favourite height of the handle is 3 ft. 9 in., at which height a lock is most easily actuated by a lever handle,—as is most common in France, Italy, and Germany,—or by the less common crutch handle, or the ordinary Dutch form, which is like a thick gimlet handle. I may here note the utility of the elegant French lever handle for glazed doors. Doors that are to be glazed being usually made with diminished stiles in the upper part, the hand must be kept well clear of the jamb of the door. Lever and other powerful handles, however, speak volumes as to the mechanism of the Continental lock, which is obstinate and noisy as compared with ours.

So the Continental door may be divided into panels of any proportion as to height at the pleasure of the designer,—or may not be divided at all: rather often it is of one panel only. I show an example from Holland (fig. 2), the panel measuring as much as 6 ft. by 2 ft. 6 in. The two-panel door, exactly like my Hereford example, is very common everywhere in rooms of small importance, the panels being often of different heights. My example from Leewarden (fig. 3) is constructed in a curious way,—first, a slab like a table-top, but only ¾ in. thick, was made of the full size of the door opening; then on each side of it thin boards ½ in. and ¾ in. respectively were laid or planted on, to show as stiles and rails. On the outside these stiles were run the full height, so as to imitate the usual form of framing; on the inside the rails were run out the full width, so as to strengthen the door by the crossing of the imitation stiles and rails. Doors so constructed,—of which I have seen several,—seem to stand about as well in ordinary work as others, and I came to the conclusion that for some reason the Continental joiner may construct his door anyhow with impunity.

The three-panel door is the most common, and is used in the best work. My examples show every mode of arranging the panels; they are exactly like those given in Le Pautre's book. The three panels may be of equal height (fig. 4), or the middle panels may be the longest (fig. 5), or the top and bottom panel may be equal with a narrow panel between (fig. 6), or the top and bottom panels may be of different heights. Hence the possibility of considerable variety. These panels are not very often moulded on the rising, but sometimes a projecting moulding is planted on. There is great variety in circular work on doors. I think it is seldom satisfactory, being contrary to the nature of the material, and likely to split. I have here a pretty good specimen from an old house at Herne Bay (fig. 7).

As to the mouldings round the panels. The custom of planting them on is now nearly invariable in England, using flat ogee mouldings, more or less elaborate. The old custom here, and the present custom abroad, is to work them on the styles,—a simple ovolo, or quarter-round, which cannot well be planted in, being the most general. The use of the bolection moulding, which projects beyond the face of the framing, is rare, and they put it on as we do; but that is not the proper way of making a bold projecting moulding round a panel. Rondelet's "Art de Bâtir" gives modes of framing in which a solid piece of moulded stuff thicker than the door is introduced between the stile and the panel. Elaborate groove and tongue arrangements are made for uniting the several parts. The author says these mouldings have gone out of use. Something similar may be seen in English books; but I fear they are seldom used here. The detached bolection moulding supplies their place. In good polished work you may screw these mouldings on to the panels from the back, and afterwards cover the screw-heads with an ordinary moulding on the other side, or may dowell another bolection moulding on that side. Nobody will distinguish between this and solid work, and if you posted a man by the side of the door to proclaim it, very few outside this room would care whether the work was solid or not.

The English door is put together in this way:—The two stiles run the full height,—as is the practice with such framing everywhere; the rails are tenoned into them; the lock rail, and, perhaps, the other rails having double tenons; the top and bottom rails have their tenons reduced or shouldered, so as to keep the mortice away from the ends of the stiles. All these tenons go through the stiles, and the framing is fixed with wedges and glue. A good Continental door is similarly made, but pins are nearly always used, and the corners of ordinary doors are often strengthened by L irons. The edges of our doors are made nearly square (fig. 8), being fitted into a simple rebate, so that the door is flush with the architrave, or sunk to the depth of the bead at its edge. The hinges are always a disfigurement, as they do not line with anything on the edge of the door or its dressings. Every joiner has his own view of the way in which a door should be hung. In one of the examinations in joinery of the City and Guilds of London Institute I set a question as to the mode of hanging a door, the faults to be apprehended, and the precautions necessary to avoid them. There was a surprising number of thoughtful, excellent replies from all parts of the country. One important point was the total difference to be allowed between the width of the door and its opening,—a quantity difficult to define, something between ⅛ in. and ¼ in. Thirty years since I went down with Mr. George Myers to look at the doors of a large mansion, which his men were hanging so that many of them sprung open after being closed. We looked on while the case was being argued out by the men immediately concerned. All agreed that the doors were "hinge-bound." I remember, when the clerk of works insisted that the fixer should gauge the space with a half-crown, Mr. Myers promptly broke in with the suggestion of a halfpenny, because the joiner's wife would most likely take care of his spare half-crowns. In important work a brass gauge may be used.

The continental joiner has not much difficulty as to nicety of joint, for the door is commonly hung to project ½ in. in front of the face of the architrave, and is rebated and moulded so as to hide the junction. I show several examples (fig. 9). The doors are too thin for our short butt hinges, so old-fashioned projecting hinges 8 in. by 10 in. long are commonly used, often driven into the door, projecting outward, and made rather ornamental. In Holland, from whence most of our notions of joinery must have come, doors are generally made thicker, and hung in a rebate flush with the architrave, as with us.

One of my Dutch examples shows a small quarter hollow taken out of the edges of door and architrave, so as to form a semicircular channel. In this the knuckle of the hinge lies symmetrically. If you can get fixing for the butt hinge, the idea is worth considering. It is rather common abroad to see a door that is meant to be self-closing hung with a pivot on the floor, a crank being formed on the pivot so as to throw the door out of upright. We do the same thing by means of rising butts. For my part I see no utility in such contrivances. The door of a room should stay exactly where you leave it, and I was always taught to leave a door exactly as I found it.

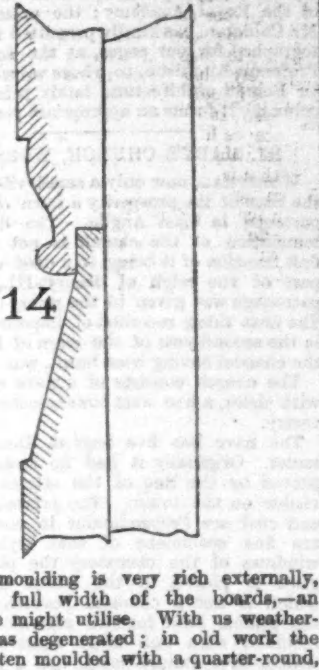
The English rule, by which every room is entered from a passage, and most rooms are unconnected with any others, has no force abroad. There the rooms of a floor will often communicate throughout, independently of passages, and the sole access to a bedroom may be through a sitting-room. Hence the importance of the French proverb, "a door must be either open or shut." Folding doors between such rooms are very common,—not the wide doorways by which we make two small rooms into one large one, but openings of 3 ft. 6 in., or a few inches more, and made lofty, so as to look handsome when both leaves are thrown open (fig. 10). If you have to squeeze a little when one only is open, you know that there is the other if you like to use it. See Le Pautre's designs and my examples. That from Dresden (fig. 11) shows the way in which all the rooms on the principal floor of a house communicate by means of doors 4 ft. 3 in. wide, the leaf usually opened being the largest, and 2 ft. 5 in. in width.

Our external doors are designed on the same principles as internal doors, but thicker and with more use of the projecting bolection moulding, and with more variety in the arrangement and execution of the panels. Any good neighbourhood built more than fifty years back, such as Bloomsbury, will show an immense variety of severely Classical patterns. There is much more sameness and a more obtrusive show of cheap mouldings in doors of the present day. Our churches of the eighteenth and early nineteenth century, and our Classical public buildings, such as the National Gallery, contain excellent specimens of panelled doors for all to see. The doors of St. Pancras Church, taken in connexion with the stonework, are amongst our finest samples of noble entrances. Abroad, entrance doors of important scale are abundant, and the design often elaborate, even to extravagance. They are generally made folding. I show examples of French doorways of varied design. The habit of combining stable buildings with town houses causes the necessity of grand doorways, 10 ft. wide by 12 to 20 ft. high, framed with wickets. It is common to have large open or glazed panels in doors filled in with good patterns of ironwork, so that you may inspect a visitor before letting him in. In Italy, a good strong door has always been thought necessary for defence,—or, at least, for exclusion,—even by day. There the habit still lingers of keeping a visitor standing outside the door, even if he is on friendly terms, while the servant, who has identified him through a little barred opening, goes to take the master's directions before opening the door.

In the practical details of a door,—as in everything else,—if there are two reasonable modes of effecting an object, the Englishman will choose one mode, the Frenchman the other. We have one familiar design for the meeting of a pair of folding-doors,—by rebating and beading the stiles; in good work a fillet is added inside. The French prefer to put the fillet outside (fig. 12). It is often made exactly like that at the junction of the great bronze doors of the Church of SS. Cosmo and Damiano. Often, too, it is made as a slender pilaster, with cap and base.

After a pretty long observation of Continental joinery, I was puzzled to understand how panelled doors, such as I have been describing, stood so well. The construction seemed risky at the best, the workmanship not particularly good; but a cracked panel or a joint that has failed is hardly to be seen. At length, when I was staying in a fine palazzo, or mansion, in an Italian city, I observed a very interesting door of recent construction, simply stained, and, therefore, easy to examine in detail. I exhibit its portrait (fig. 13). It is 6 ft. 6½ in. by 3 ft. 3¾ in., or a fifth larger in surface than our usual full size; yet its thickness is only *a bare inch*, and it bends like pasteboard, but springs back readily into shape. The three panels are over 2 ft. 8 in. in width. Each is made up of five or six pieces of board of different widths, some being wedge-shaped, as is not uncommon in countries where our clean, straight deals are not known. The panels are only a full ¼ in. thick at the edges, and, being raised on one side, are a bare ½ in. in the centre. I have seen such panels in the workshop, glued up ready to plane. No two pieces are of similar thickness; the surface is incredibly rough and hopelessly twisted. In the whole door I counted 110 noticeable knots, besides heart-shakes, and two or three holes that had been neatly filled in. The joiner who had made it eighteen months before, told me it was made up of odds and ends of some common fir, which his employer, who was economical, wished him to use up. He should have preferred cedar, and the door ought to have been a quarter of an inch thicker. The panels were not tongued, but simply joined with the best Naples glue; the mortices for top and bottom rails were cut out to the ends of the stiles, though he knew that in old work that was not done. Still, he would warrant his door to stand (as, indeed, it did), for the boards had been laid up more than a year in the house, and were perfectly dry. I came to the conclusion that this thorough seasoning is the secret of the whole matter. If it is not, I know no other. As to the joints in the panels, I have seen cases of failure in large church doors, and they were either ploughed or tongued solid, or were dowelled together. They had failed from exposure to the weather.

Our common ledged door is limited to entrances of little importance, but, on the Continent, it is often used for doorways and for large carriage-gates. The English notion is to show the boards perpendicularly; abroad they are very often put horizontally, like feather-edged weather-boarding, or are sloped both ways from a central line, and are moulded on the lower edge, the upper board rebating over the lower. They are nailed on to a back of perpendicular boarding (fig. 14). Sometimes the moulding is very rich externally, nearly the full width of the boards,—an idea that we might utilise. With us weather-boarding has degenerated; in old work the edges are often moulded with a quarter-round, or at least with a bead.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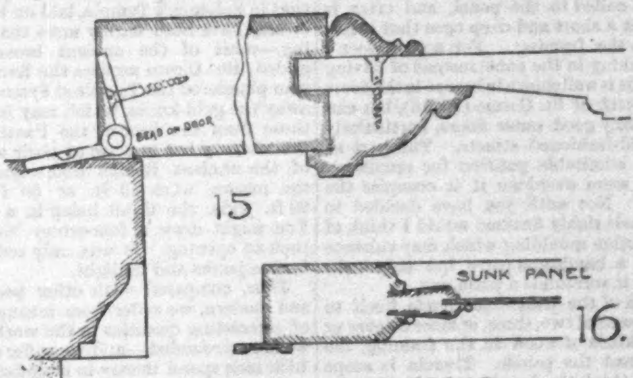
No notice of Continental doors would be complete without reference to those left by the Moors, who for a long time held possession of Spain. Their art was similar to that of all the Mahommedan races,—in Turkey and the East generally. Of these I exhibit several examples, framed very much like our own doors, the panel being, however, kept flush with the framing, and composed of a mosaic made up of different kinds of hard wood inlaid with ebony and ivory, forming exceedingly beautiful interlaced patterns. One of these doors is covered with leather fixed on plain upright boarding by many pieces of ornamental bronze. In the north-west corner of the South Kensington Museum very beautiful examples of such doors can be seen. Knockers were common, as they were in ancient Rome, where bells also were used. The Dutch, from whom we get our notions of quiet, homely comfort, object to knockers, because they make a harsh, disturbing noise; they prefer bells. But no one ever goes through the front, or show, door of a real Dutch house, except to be married or buried.

I have already said as much as I think useful about door furniture. As regards the best class of English work, we have very little to desire, and I know of nothing that we could learn from the Continental practice.

Thus far I have been treating of Continental as compared with English doors, and, to some extent, of the ancient examples from which both these have been derived. Such studies must leave on our minds some very interesting impressions. We see that from the earliest times, even before the dawn of history, men delighted to have the entrances to their buildings nobly designed and beautifully adorned, and this sentiment has continued down to the present day, though not to any great extent amongst ourselves. I cannot call to mind that I ever saw any one pause before a modern English doorway with wonder and admiration, as the travelled and experienced Ulysses did before the palace gate, or take any kind of interest in it, except as an obstacle to be pushed aside. A cynical friend of mine avers that he once caught some one very much interested in a door, but it was evinced by applying the ear to it,—not the eye. We are very far behind most other countries in the art of making things *interesting* by their grandeur, richness, or beauty of design. Through carelessness and the pressure of other occupations and thoughts we neglect to appreciate such qualities. It is not so on the Continent. Italy is a store-house of noble and beautiful objects of all kinds and of all ages. France, less rich in ancient examples, is better able to find the means of producing costly modern works, and I have shown how great its influence is upon all Continental countries. In a very striking passage, written 750 years ago, and which ought to interest us, William of Malmesbury compares the English before the Conquest with the nearest Continental people. He says:—"They,—that is, the Saxon English,—consumed their whole substance in mean and despicable houses,—unlike the Normans and French, who, in noble and splendid mansions, lived with frugality." Whatever their faults, they were good friends to the carpenter, and the Frenchman of to-day retains much of the same sentiment; so that there is still a good deal of the same sort of difference between the two races. In choosing between different ways of doing a thing, the Englishman instinctively prefers that which is strong and works well,—the Frenchman that which, to him, looks grand or beautiful, not doubting that he will manage to make it work. He would make great sacrifices in matters which we should consider unnecessary, in order to keep up a creditable appearance. It is not very easy to illustrate this by examples, but all these drawings of French doors of a superior class show them to be more spacious and lofty, and very much more richly ornamental than anything that would, under similar conditions, be executed here. In the matter of ornament, I think you will see a strong tendency to excess, some of the designs for external doors presenting an incongruous mixture of details that seem put in merely to cover up every inch of the surface, leaving no repose for the eye. I am fortunately able to show two cases where the English and the French designer came into direct contact. My own house was built some sixty years ago. The more prominent parts are decorated with very nice and satisfactory Greek details. As to those parts that are less prominent, one would feel ashamed to confess a lack of interest in anything so thoroughly respectable. A few years later the then owner had the chief rooms redecorated by French artists in the style of Louis XV. I show the original and the altered designs side by side. In the dining-room the flat panels of a good ordinary English door have had an enriched bead planted on to imitate a raised panel. All the plain mouldings have been replaced by enriched work, and the whole is finished with a highly-ornamental cornice and a broken pediment enclosing a vase of fruit. I am not aware of any principle of art that will support any part of this decoration, but all ordinary people seem pleased with it in its place,—and I am blessed with the friendship of many ordinary people. In the drawing-room floor each door was heightened by 10 in., and a highly-decorated panel was placed over it inclosing an oil painting,—the height of the whole composition being thus raised from 7 ft. 2 in. to 11 ft. I do not know where to find a more choice example of an utterly indefensible style. The panels are made to dance and twist out of all shape. Shells, scrolls, and vagrant sprays hook on to each other; and mouldings and ornaments are alike covered with gilding, all being exceedingly well executed. I have been asked by a serious-minded friend how I can possibly eat, work, or sleep in view of such monstrosity. Fortunately, I can laugh at it; and I am now told that it is coming into fashion again, which is perhaps a pity.



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16.

DOOR AT ST COSMO

Leaving these considerations of what other people have done, I will now venture some opinions of my own on the whole subject,—I do so in the expectation, and indeed in the hope, that many will differ from me, and feel ready to support other opinions of their own.

I daresay several of us will have to design or to execute work of this kind, and will feel desirous of bringing serious thought to bear upon it. I hope no one will have the idea that questions of taste,—about which there is so much dispute,—are no concern of his. Many times have I heard from working men the notion that "taste" is something beyond their province, and impossible to be acquired,—a very mischievous notion. In all ages, when good art flourished such as everybody now admires, the good work must have been not only executed, but to a large extent designed, by the workman. Some of the best work of all kinds that has been done in our own time is due to workmen who, if they have not actually executed, have, at least, designed and directed it. There is infinitely more opportunity now and in the future for the ability to be acquired by the men for whose advantage these lectures are given. As I am privileged to give the last of this course, I will offer a few hints which, I trust, will not be out of harmony with anything that my colleagues who have preceded me have said. To design so as to please and interest those who are judges of work, or who possess what is called "taste," you will have to take a great interest in the matter. Being possessed of some practical experience in work, and of skill in the execution of it, you should search out the most admirable examples of similar work. Of all the lectures that I have heard, those have been most useful to me at which I could see such examples, and hear of others. There is very ancient authority for this. In the splendid shining palace, of which I have more than once spoken, there sat the lady of the house with her maidens before the beaming fire, spinning and weaving the sea-purple threads of wool "wondrous to behold." They were skilled above all other women in weaving the web, "for Minerva had granted to them exceedingly *to be acquainted with beautiful works*, and endowed them with a good understanding." These seem to be the two things needful. The man who has them need not tie himself down to the views of other men, which will change from year to year, but will be able to contrive beautiful work that will interest others, though he himself may change. I am sure that if a few workmen were to combine and make the subject of doors or of doorways their study, meeting occasionally for exchange of information and ideas, they would acquire in a few months a knowledge of, and an ability in, designing and executing work of this kind that would be very beneficial to themselves, and useful generally. And I should be very glad to help forward such an undertaking so far as I can.

I will now offer the observations that occur to me on the practical and artistic details of doors:—First, it will be observed that the ordinary English door as I have described it,—and as we all know it,—is an object upon which the smallest possible amount of art or skill has been employed. Every part of it is prepared by machinery, and it only requires to be put together. A young apprentice rapidly acquires the art of doing this, and an experienced joiner can hardly improve upon it. When a door requires to be rather more handsome than is common, a heavy bolection moulding is used, and this is about the end of the ordinary stock of ideas on the subject. That is a condition of things that one is desirous of improving, so far as may be possible. I think the thickness of a door should not be very much diminished in imitation of foreign examples. I rather suspect that our people are less gentle in their movements than some others. A thickish door will take better mouldings and better hinges, and is less injured by the cutting away for a mortice lock. Upon this point, I may notice a lock which some one has sent me, pointing out that it only requires a hole bored with an inch auger. He tells me I could myself fix it complete in fifteen minutes. I have no doubt that I could, but I cannot afford to make a failure, so I shall not try. If it continues to work as well as it does now, as a sample, it seems a very useful invention. I should not copy the foreign fashion of hanging the door out in front of the opening, but in a deep rebate behind the face of the grounds; the edges of door and jamb lining might have a small quadrant hollow, worked on them, as I have shown in a foreign example. As regards the hanging of outer doors that are mostly kept open, I prefer the mode known as "warehouse fashion" (fig. 15), because it looks well and throws the door back quite clear of the opening. The next question is the panel. Not only for the sake of variety, which is of itself a distinct advantage, but as a means of producing a pleasing effect, some of the foreign plans of wide panels might be adopted. The lock rail should remain where we put it, one or two panels being put over it. The panel should more often be raised, either on the bevel, or with a simple flat border of 1½ in. to 2½ in., and a very small moulding at the rising. The mouldings for such a door should never be the wide flat ogee that looks as if it were nailed to the panel, and often is so nailed, but a short and deep ogee that seems to belong to the framing. For a good door I suggest a sinking in the panel instead of having it raised. This is well shown in bronze in the doors from the Church of St. Cosmo (fig. 16), but can be seen in many good outer doors, particularly in rather old-fashioned streets. The part so sunk is an admirable position for ornament, which may seem overdone if it occupies the whole panel. Not until you have decided to have the panels richly finished would I think of using a bolection moulding which may enhance the effect of a handsome panel, but only looks coarse when it surrounds a plain one.

The design of the panel-door lends itself to the employment of two, three, or more colours or of different kinds of wood in the framing, the mouldings, and the panels. Therein is scope for taste. I think the framing should be quiet in colour and free from pattern, and the mouldings of decided colour. If they are not part of the framing, that is a reason for making them different in colour or material. The place for ornament in a panel door is the panel. I remember a room in a fine country house in which the owner desired to use his ample stock of oak so as to produce a handsome effect. He not only had the panels of the wainscotting cut so as to show the silver grain, but the whole of the framing as well. I have explained in this room how this is done at some extra cost in sawing. The cost was of no consequence, but in the opinion of every person of taste he had spoiled the effect of the wainscotting by making the framing as rich as the panels, and thus fatiguing the eye by an abundant exhibition of patterns with no plain space between. The plain surface of a raised panel is the place for a piece of very beautiful veneer or a higher class of ornament. Other kinds of ornament may be so used, such as inlaid work in geometrical or foliated patterns, or even in pictorial designs. The sunk centre of a panel is a still better place for flat ornaments of a choice kind. I exhibit some specimens of beautiful work, which we may call Saracenic, that have been kindly lent by Messrs. Liberty & Co., of Regent-street. A visit to the South Kensington Museum will enable you to examine at leisure a great variety of inlaid work and wood mosaic in the furniture department and in the Jones collection. You will see not only hard woods in different colours used in the patterns and in the pictures, but ivory and mother-o'-pearl. This probably indicates the still more extensive use of such rich materials in very ancient times, and the very slight amount of exaggeration that the old poets and dreamers used in their magnificent descriptions. One of Le Pautre's designs, which I have enlarged, shows a painted landscape in the large upper panel, a work which, if well executed, might perhaps have been better put on a more secure place. Carving in low relief may be very fitly introduced in the panel. There is a very interesting example of this in Sir Gilbert Scott's entrance-doors to the Midland Station Hotel. Carving in high relief can only be fitly used in doors of the highest importance, and is apt to run into extravagance in figure sculpture. In the South Kensington Museum are the doors of St. Maclou at Rouen, and I exhibit an engraving of some doors of extraordinary richness from Burgos*. In the same Museum is a small bronze German door from Sigmaringen, the mouldings being gilded, the panels silvered, and containing figures in high relief. There also you may see a copy of Ghiberti's doors, gilded and more like their original condition than are the actual gates at Florence. This work is criticised more severely than other examples because it is the most important and the most interesting of its class. It is easy to say that the groups and landscapes he has produced are more fitted for painting than for sculpture. To do something that is interesting without the least trace of extravagance is a task that has not been so very often accomplished, so the artist of to-day has a fine field before him. In avoiding that danger he will run an equal risk of doing something which nobody will give themselves the trouble to criticise.

We must not overlook two great elements of interest in doors,—costliness of material and magnificent dimensions. Though these are very far inferior in value to the art of the cunning craftsman, mean materials and insignificant size are much too often seen, and greatly detract from the interest of a work. The gold of which we read on ancient doors was probably like that in Solomon's Temple, laid on in thin plates, or may have been hardly more than thick gilding,—most of the ancient bronze-work was gilded. But Cicero accuses the Roman governor who plundered the Temple at Syracuse of taking away the gold knobs, which may have been like those from the door of the Pantheon, not for their beauty but because of their weight. Some of the ancient Roman doorways, as left by the mason, were 40 ft. or 50 ft. high and 20 ft. wide, the lintel being in a single stone. You might draw a four-storey house through such an opening. It was only reduced by the bronze jambs and fanlight.

Thus, compared with other people, ancient and modern, we suffer from meanness and lack of interesting qualities in the work with which we are surrounded,—and we suffer unnecesarily. Rich men spend money in abundance on trivial and unworthy objects. We ought to tempt them with work that is interesting and will endure.

A few of my drawings have been brought here chiefly to show the unbounded honour that has been paid to the door in ancient, mediæval, and modern times. Though often comparatively mean in itself, it is surrounded with sculpture of the richest kind arranged in designs of magnificent dimensions that sometimes extend over nearly the whole front of which the door is the central feature. The subject of these portals or grand architectural entrances would be inexhaustible: the skill that has been lavished upon them shows the importance of our subject—the door. Not being now engaged upon such work as this, I have desired to treat it as an important branch of one of the grandest studies which the architect and the skilled workman can undertake. He who adorns the building helps to ennoble the town, adds interest to life, raises to higher thoughts, contributes to the honour and reputation of his people and his country. If to Minerva we owe our good understanding, may she also "grant us exceedingly to be acquainted with beautiful works!"

Sayers Drinking Fountain Competition, Southampton.—We are informed that sixty-eight competitors sent in designs for this fountain, and the premium has been awarded to Mr. Sydney Kelway Pope, of Southampton. The following in their order were the designs adjudged next in merit:—"Institution," Mr. W. J. Taylor, Southampton; "Sir Bevis of Hampshire," Mr. Alfred F. Gatteridge, Southampton; "Pro Bono Publico," Messrs. Lawson & Donkin, Bedford Buildings, Bournemouth; "Fides," Mr. Geo. H. Bailey, London; and a design bearing the emblem of a cross on a shield, by Mr. Charles Hide, Worthing.

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* See the *Builder*, Feb. 21, 1880.

Illustrations.

VIEW IN THE TEPIDARIUM OF CARACALLA'S THERMÆ (RESTORED).

THIS illustration, from a drawing by the late Professor Cockerell, is a restored view of the interior of the Tepidarium in the Thermæ of Caracalla at Rome, according to Professor Cockerell's idea of the original architectural design of this great hall.

The drawing, of which we believe no print has before been published, is in the possession of the Royal Academy; the present Keeper, Mr. Calderon, has kindly permitted it to be photographed for our pages, at the suggestion of Professor Aitchison, to whose valuable lectures on Roman architecture, lately printed in our columns, it forms an appropriate pendant.

ST. MARY'S CHURCH, WORSTEAD.

Worstead, now only a small village, was in the time of its prosperity a town of some importance in East Anglia. The date of the foundation of the church is not known, the first mention of it being in a deed of the early part of the reign of Henry III., when the patronage was given to the priory of Norwich. The next thing recorded of importance is that, in the second year of the reign of Richard II., the chancel having been burnt, was rebuilt.

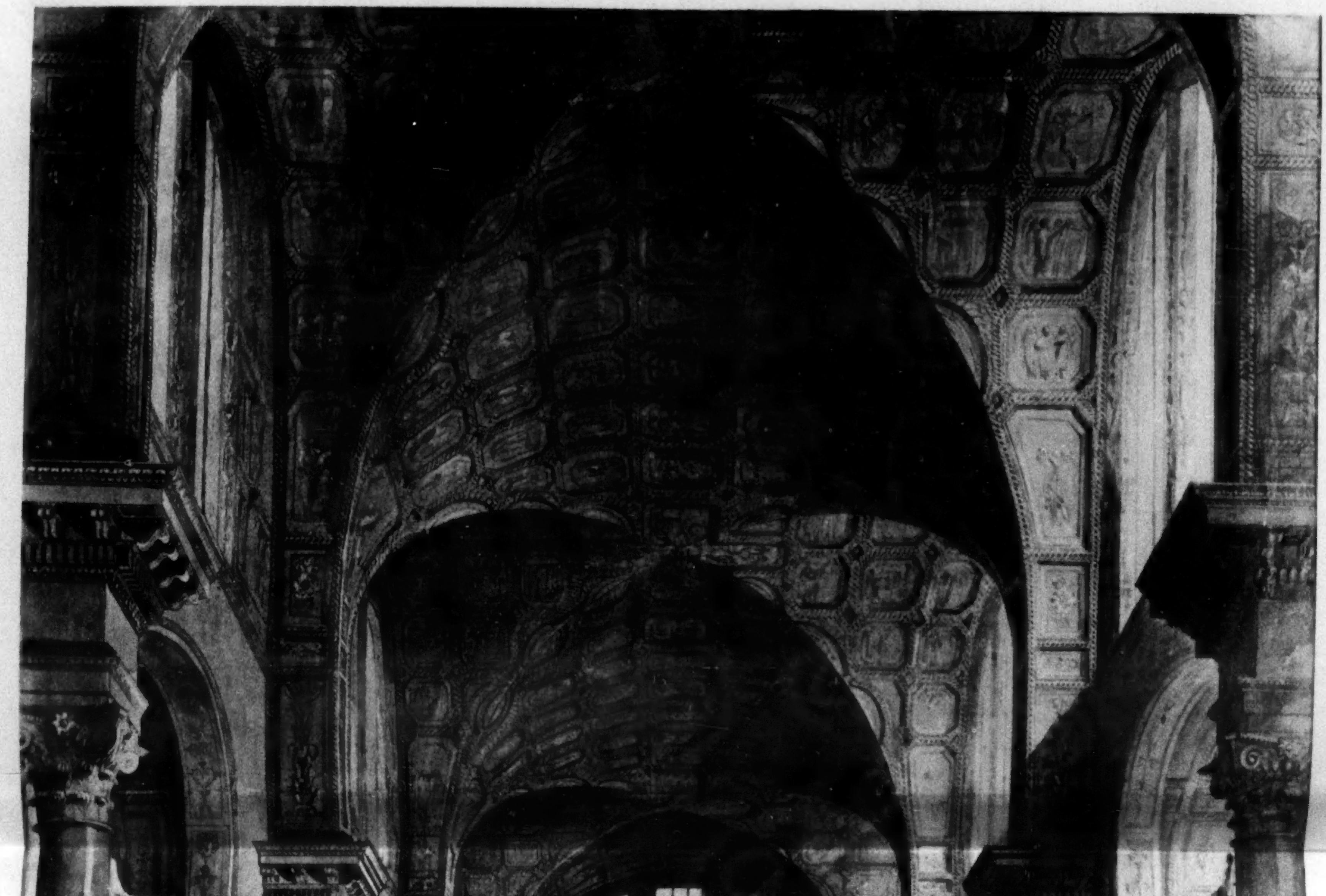
The church consists of a nave and chancel with aisles, a fine west tower, south porch, and vestry.

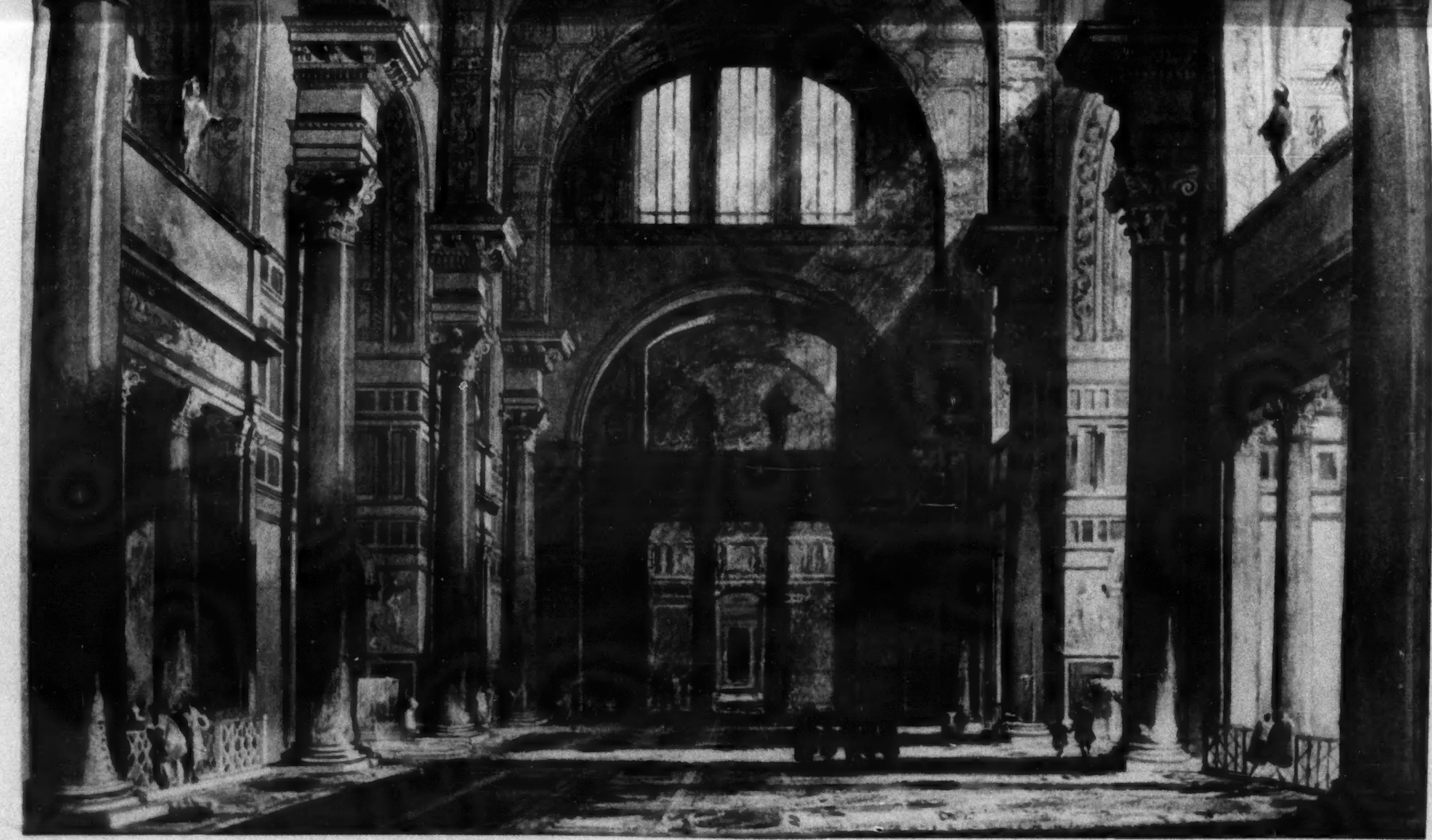
The nave has five bays of Decorated character. Originally it had no clearstory, as is proved by the line of the original roof, still visible on the tower. The present clearstory and roof are Perpendicular in character, and are fine specimens of that style. In the windows of the clearstory the plane of the glass is placed in the centre of the wall, which is not a common position in Norfolk, the jambs, both interior and exterior, being moulded with one large shallow casement, which, thus simply used, has a good effect. The roof is a good example of the hammer-beam type, but it had so thrust out the walls at a period apparently not very much subsequent to its erection as to necessitate the addition of flying buttresses to support them.

The aisles are undoubtedly of the transition from Decorated to Perpendicular, but one is surprised to find, after carefully cleaning from them the whitewash in which they are buried, that the mouldings of th[illegible] and bases of the rereshafts of the windows are of apparently much earlier character.

The tower is a good specimen of a Norfolk tower of the late Decorated period; but its beauty is considerably marred by the heavy character of the pinnacles, which were erected in 1861. The basement is one of the best of its kind, presenting a combination of flint panel work, sunk quatrefoils, and bold, well-profiled mouldings; the quatrefoils are slightly undercut, which gives them a peculiarly bold appearance. The west doorway and window exhibit an early example of the union of these two features into one composition. One mistake the builders of this tower made, in placing a staircase in the thickness of the wall at the north-west angle, which has materially weakened this part, and, consequently, the whole tower. All the parts described above are built with excellent workmanship; the dressings are of a shelly oolitic limestone, which has weathered exceedingly well; the walling is of flintwork, with galletted joints; the flints appear to have been obtained from the beach, about five miles distant, and are all carefully split, and in the panel-work carefully squared. The mortar, however, does not appear to have been first-class, as it has weathered away, and unless the joints are soon pointed the splendid flint facing will soon be utterly ruined.

The chancel presents many curious and interesting points. Compared with the remainder of the church it is badly built, and has at various times undergone extensive repairs. The rebuilding referred to in a deed of the second year of Richard II. appears to have been extensive repairs, rather than rebuilding from the foundations, in which old materials were extensively used. This would account for the Decorated and Perpendicular capitals which are found side by side on the shafts on the mullions of the east window, for the early bowtell between two deep hollows on the jamb of the same, which changes abruptly into a shallow hollow at the springing of the arch, and for the various different

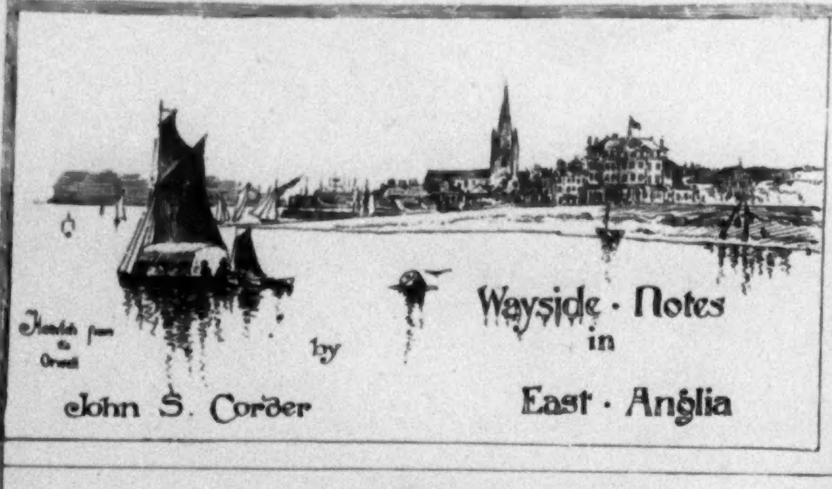




The Phototype Co., 308, Strand, London.

VIEW IN THE TEPIDARIUM OF CARACALLA'S THERMÆ, ROME.

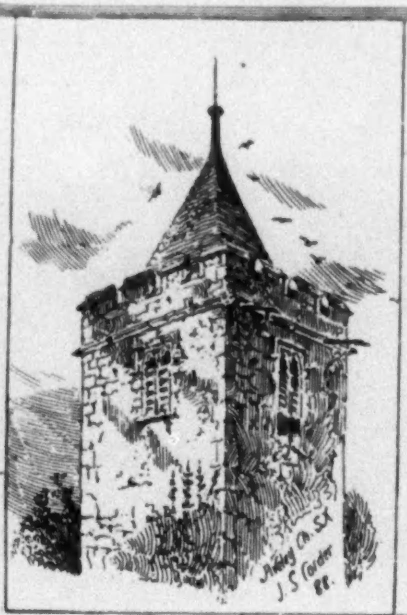
As restored by the late Professor Cockerell, R.A.

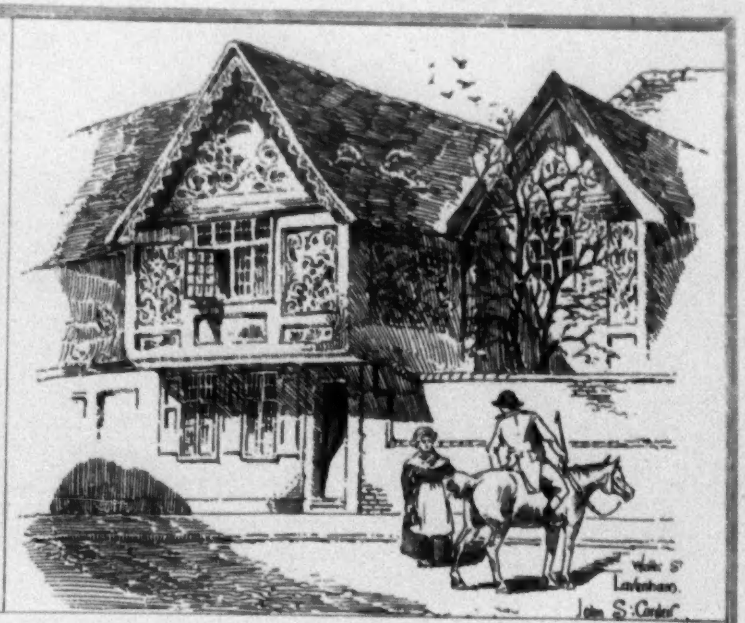

Sketch from the Orwell

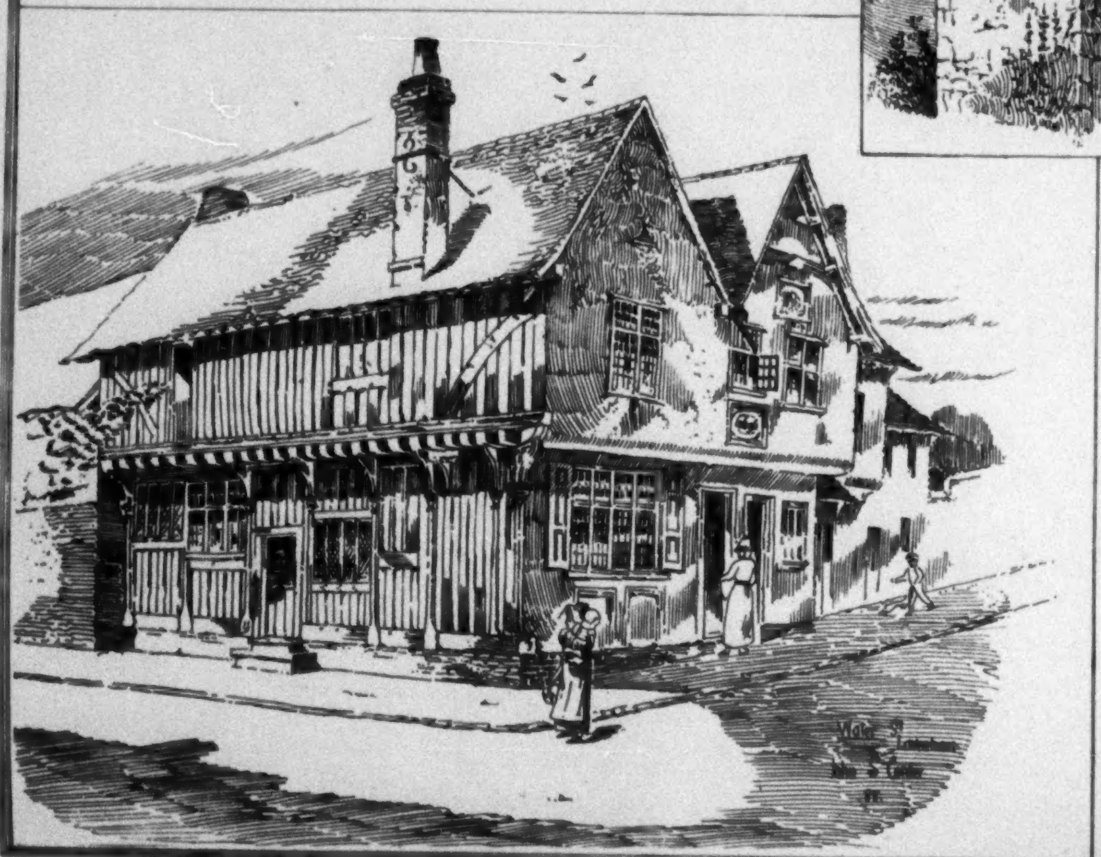
Wayside · Notes in East · Anglia

by

John S. Corder


Ch. SX
J. S. Corder
88.


Water St
Lavenham.
John S: Corder


Water St
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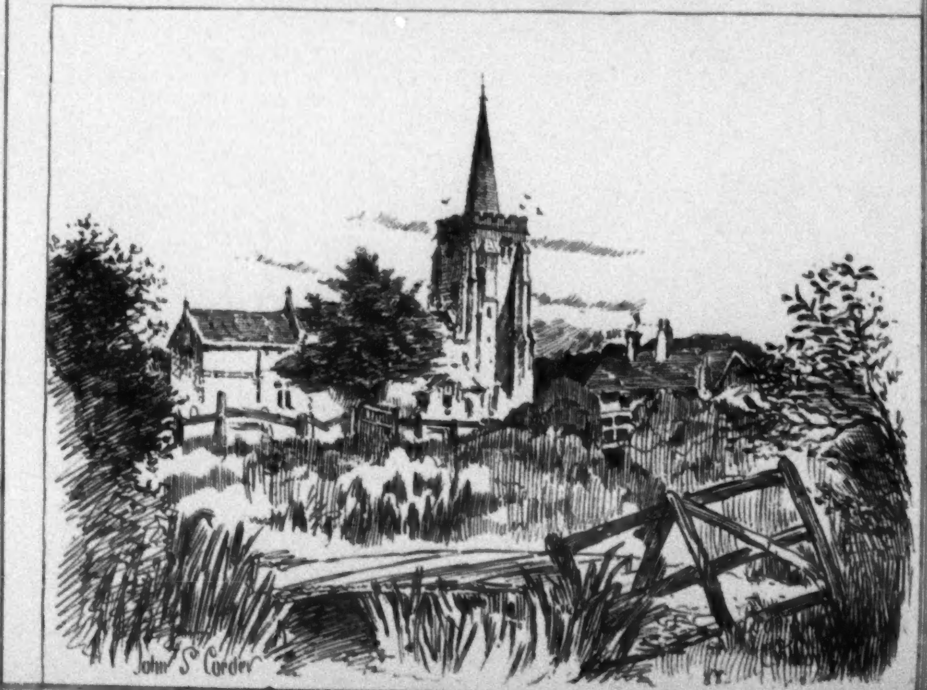
John S. Corder
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PHOTO-LITHO. SPRAGUE & CO. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

S^T MARY'S CHURCH, WORSTEAD, NORFOLK.

The dressings of the chancel are of Caen stone, which was obtained from some older building, many stones bearing mouldings, upon that part built into the wall.

The dressings of the remainder of the building are of limestone, with coarse oolitic grains, and in some pieces very shelly, a few pieces have decayed, but it has generally stood remarkably well.

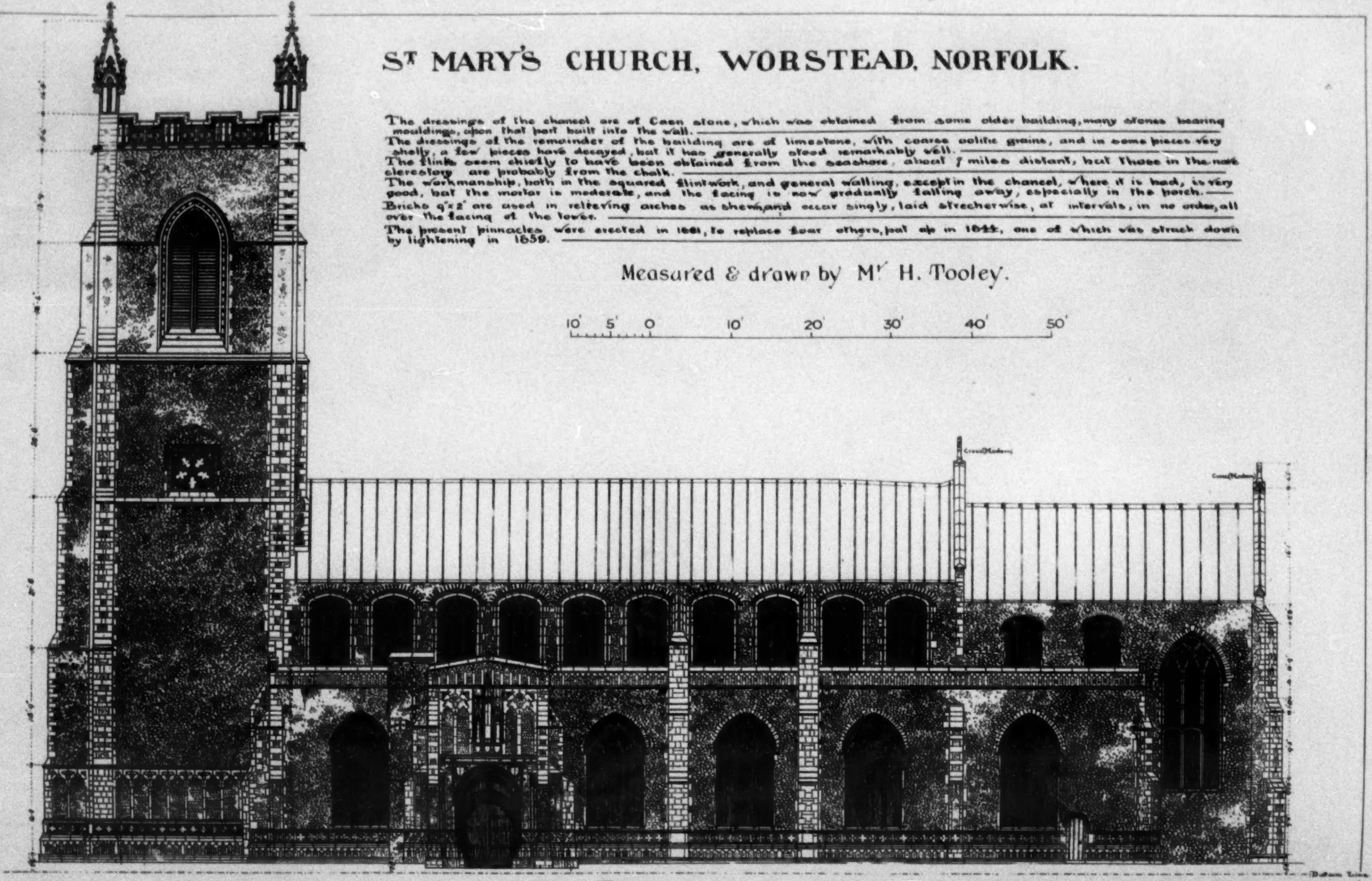
The flints seem chiefly to have been obtained from the seashore, about 7 miles distant, but those in the nave clerestory are probably from the chalk.

The workmanship, both in the squared flintwork, and general walling, except in the chancel, where it is bad, is very good, but the mortar is moderate, and the facing is now gradually falling away, especially in the porch.

Bricks 9"×2" are used in relieving arches as shewn and occur singly, laid strecherwise, at intervals, in no order, all over the facing of the tower.

The present pinnacles were erected in 1861, to replace four others, put up in 1844, one of which was struck down by lightening in 1859.

Measured & drawn by M^r H. Tooley.



— South Elevation —

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PHOTO-LITHO. SPRAGUE & Cº 22 MARTINS LANE, CANNON Sᵀ LONDON E.C.

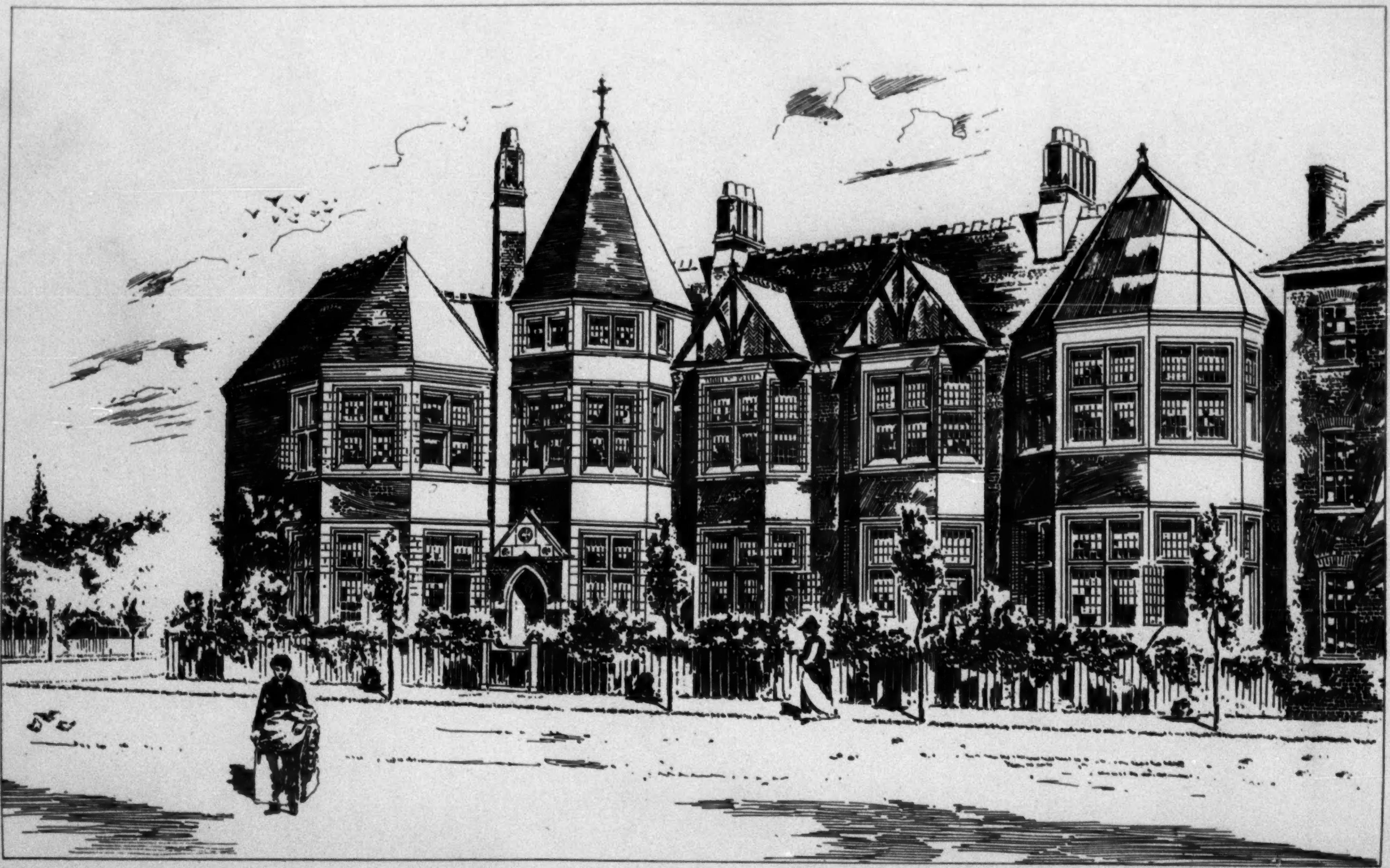
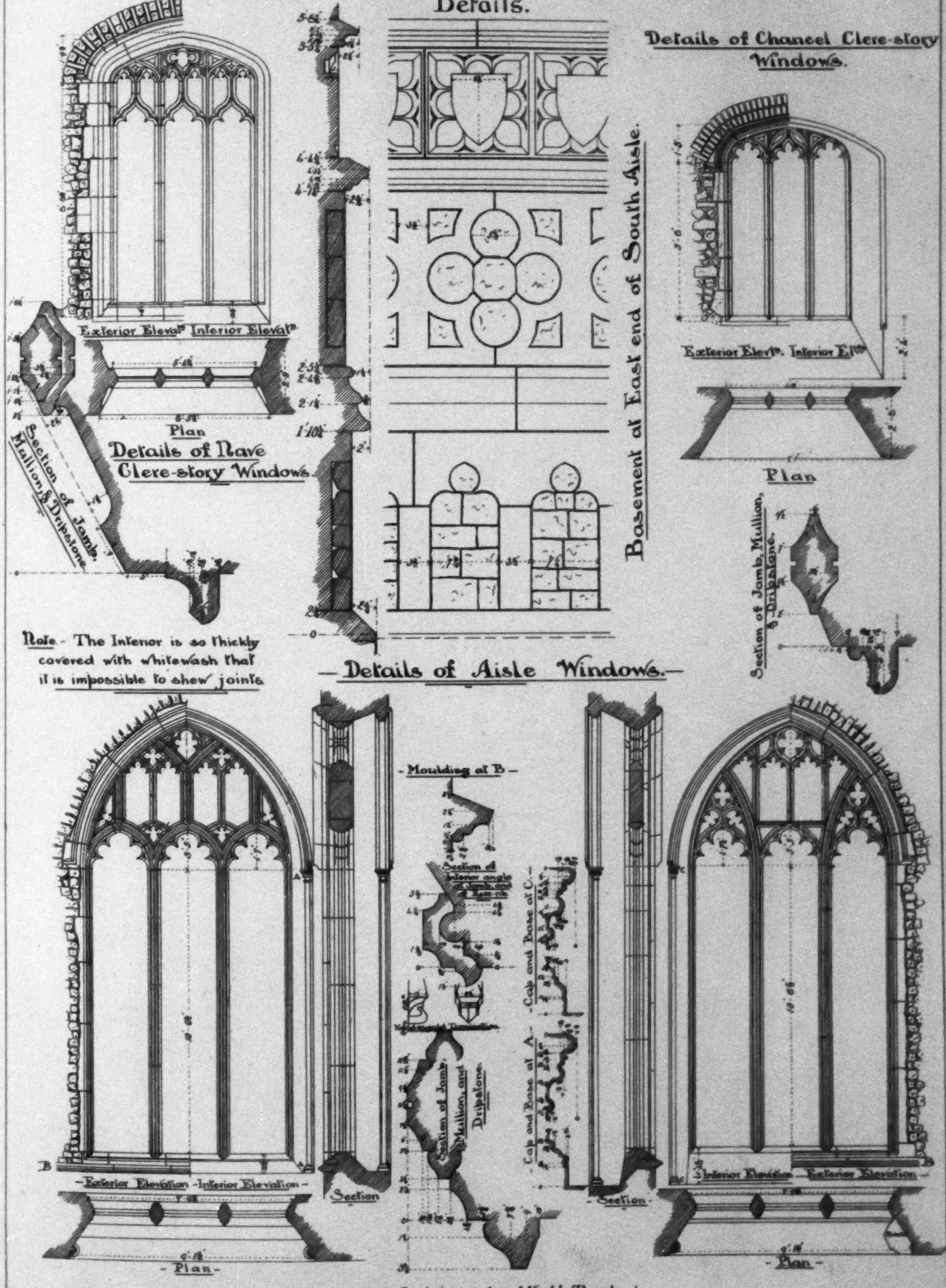


PHOTO-LITHO, SPRAGUE & CO 22, MARTINS LANE, CANNON ST, LONDON, E.C.

PARSONAGE CHURCH OF THE GOOD SHEPHERD, COURTHOPE ROAD, HAMPSTEAD.—MR. JAMES BROOKS, F.R.I.B.A., ARCHITECT.

S^T MARY'S CHURCH, WORSTEAD, NORFOLK.

Details.

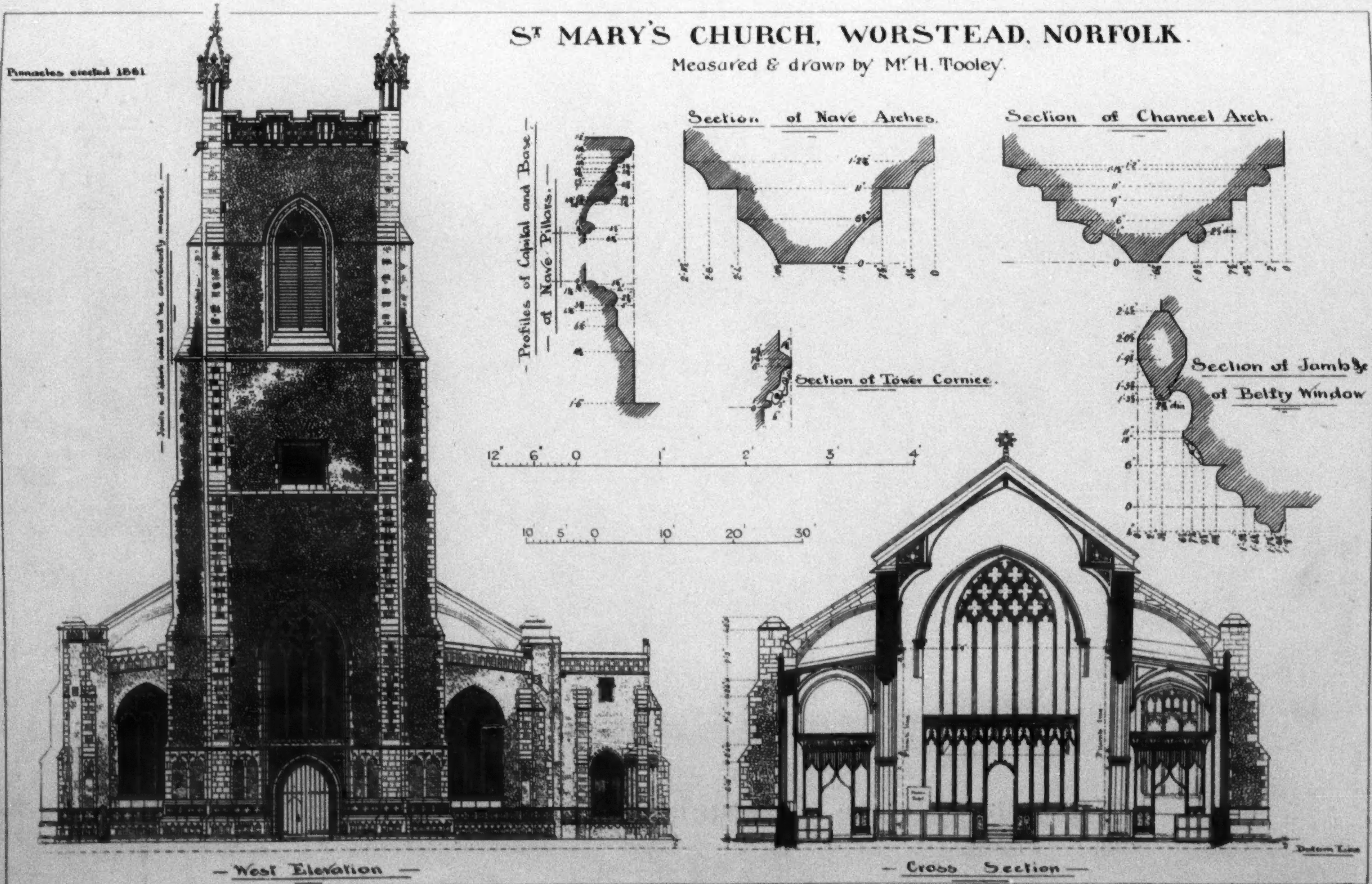

Details of Chancel Clere-story Windows.
Exterior Elevat^n Interior Elevat^n
Plan
Section of Jamb, Mullion, & Dripstone.
Details of Nave Clere-story Windows.
Basement at East end of South Aisle.
Exterior Elev^n. Interior El^n
Plan
Section of Jamb, Mullion, & Dripstone.
Note - The Interior is so thickly covered with whitewash that it is impossible to shew joints
— Details of Aisle Windows. —
- Moulding at B -
Section of Interior angle of Jamb and Mullion
Section of Jamb, Mullion, and Dripstone.
Cap and Base at C.
Cap and Base at A.
A
B
C
- Exterior Elevation - Interior Elevation -
Section
- Plan -
Interior Elevation - Exterior Elevation
Section
- Plan -

Measured & drawn by M^r. H. Tooley.

PHOTO-LITHO, SPRAGUE & Cº 22, MARTINS LANE, CANNON ST. LONDON, E.C.

S^T MARY'S CHURCH, WORSTEAD, NORFOLK.

Measured & drawn by M^r. H. Tooley.


Pinnacles erected 1861
— Joints not shown could not be conveniently measured. —
— Profiles of Capital and Base of Nave Pillars. —
Section of Nave Arches.
Section of Chancel Arch.
Section of Tower Cornice.
Section of Jamb &c of Belfry Window
12 6 0 1' 2' 3' 4'
10 5 0 10' 20' 30'
Datum Line

— West Elevation —

— Cross Section —

Photo-Litho. Sprague & Co. 22, Martin's Lane, Cannon St. London, E.C.

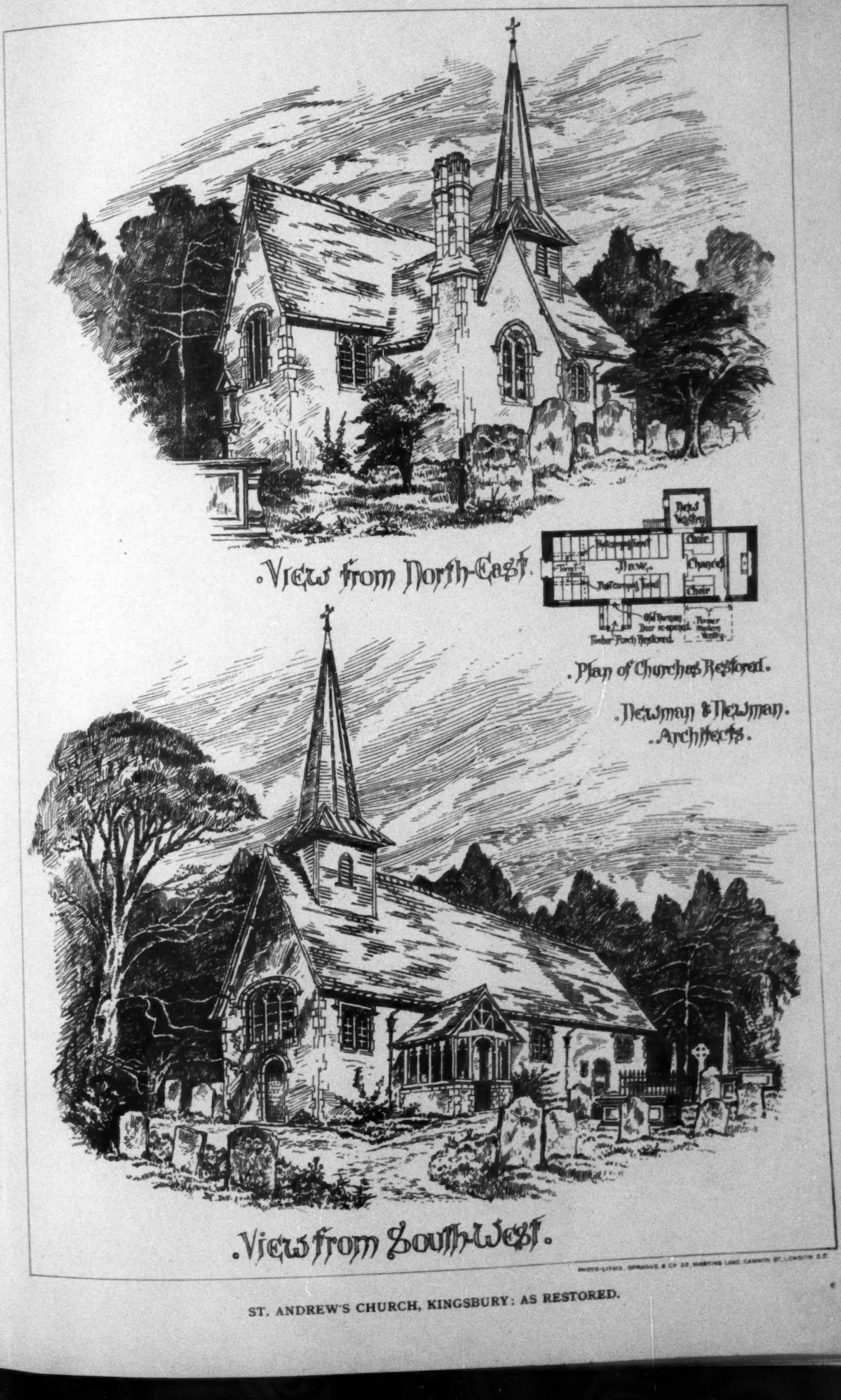
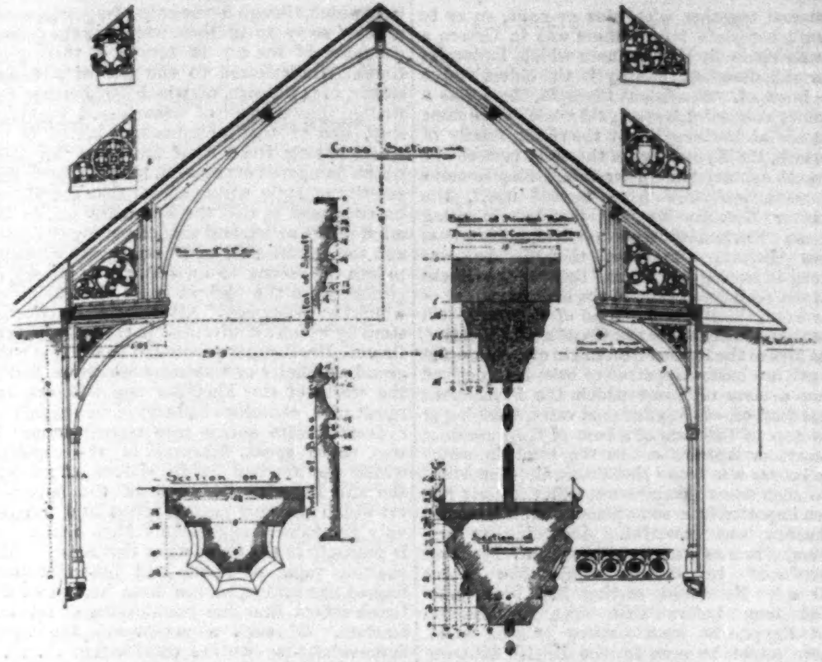
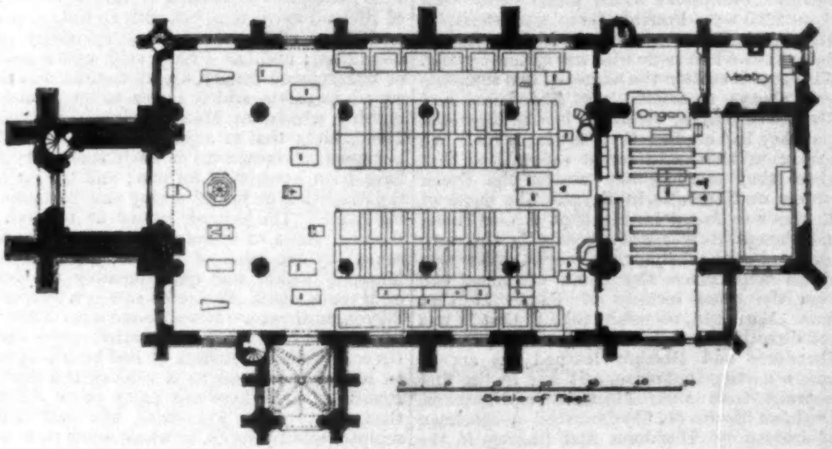

.View from North-East.
New Vestry
Choir
Chancel
Nave
Choir
Old Norman Door re-opened
Former Modern Vestry
Timber Porch Restored.
.Plan of Church as Restored.
.Newman & Newman.
.Architects.
.View from South-West.

PHOTO-LITHO. SPRAGUE & CO 22, MARTINS LANE, CANNON ST, LONDON E.C.

ST. ANDREW'S CHURCH, KINGSBURY: AS RESTORED.



Worstead Church.—Elevation and Details of Roof-principal.



Worstead Church.—Plan.

manners in which the walls are built. There are no footings to the east wall, which ends about 3 ft. under the present level of the soil.

The font (illustrated in Rickman's book) is very fine, as still are the screens, in spite of bad usage. The chancel-screen still retains much of its gorgeous painting, the small ornaments and the diapers, which form the backgrounds to the figures in the panels, being painted in such a manner as to have considerable relief, so that in some cases, where a coat of yellow paint has hidden the beauty of their colouring, the form of the ornament is still to be traced.

In many places where the whitewash has unsystematically been cleaned from the walls traces of colour decoration are to be seen, but all are in a very ruined condition.

A few small brasses still remain intact, but many stones have had the brasses stolen from them.

PARSONAGE, CHURCH OF THE GOOD SHEPHERD, HAMPSTEAD.

The view of the parsonage of the Church of the Good Shepherd is taken from the west, and is facing the ground where the permanent church is to be, sketch drawings of which are made. The parsonage is in course of erection, the builders being Messrs. Rudd & Son, Grantham, who are building the large parish church at Hornsey for the same architect. The parsonage is situated at the corner of Savernake and Courthope roads, and is on Lord Mansfield's estate; it is close to the Gospel Oak Station. The materials which are being used are red Suffolk facing bricks, with Bath stone for windows, doors, chimneys, &c. The roofs are covered with Broseley tiles, with the exception of that of the bay over drawing-room, which is of lead, and the roof over the octagon turret: this is covered with small green slates. The floors in the principal rooms are laid with deal wood-block, and a wide margin round with walnut-wood blocks. The passages are paved with Hobman's mosaic tiles. The architect is Mr. James Brooks.

WAYSIDE NOTES IN EAST ANGLIA.

Lavenham.—As I stated in my former short notice, which accompanied the first sheet of "Wayside Notes" (see *Builder* for Aug. 11, 1888), the town of Lavenham owed its prosperity in the fifteenth and sixteenth centuries to the great woollen manufactures which were then carried on there, and also to the protection of the De Veres, Earls of Oxford. Though now only a decayed town, sufficient evidence remains in its buildings to indicate the quondam opulence of the place; and thanks to the durability of their construction, the town preserves much of its pristine picturesqueness, and is beautiful even in its decay. As will be seen, the construction of the buildings consists of solid oak framing, morticed and tenoned and pinned with oak pins, filled in with clay daubing and wattles, resting on a low foundation of brick and rubble. This framing was always shown externally, and very often inside the rooms also; but as the oak decayed, it was found expedient to adopt stringent measures to exclude the weather, and external plastering was resorted to, covering the old framing. This plastering often took a very elaborate form, as in the sketch shown in the right-hand top corner of the sheet; whilst in the building in the left-hand bottom corner the plastering of the eastern gables is quite devoid of all decoration save a small panel, with the date, 1696, enclosed in a wreath of leaves. These two houses afford examples of the kind of dwellings in which the wealthy woolstaplers once resided; and though their accommodation would not altogether quite coincide with our modern ideas of fitness, yet they were, doubtless, residences of no mean order.

Bramford is a Suffolk village situated on the navigable river Gipping, about 2¼ miles N.W.-by-W. of Ipswich. The surroundings are quiet and pastoral, the flat meadows which fringe the stream affording excellent grazing-grounds for flocks and herds, and many beautiful subjects for pencil and brush may be obtained in the vicinity. The church (St. Mary) has many interesting points; the present erection dates from the Early English period, whilst many details of Decorated work are to be found in the fabric,—noticeably the stone rood-screen between chancel and nave. This church, with the Berewicks of Burstall and Albrighteston belonging to it, was given to Battle Abbey by William Rufus, and the monks had the rectory and were patrons of the vicarage till the 33rd of Henry VIII., when it was granted to Christchurch, Canterbury, in exchange. The Dean and Chapter of Canterbury are now the patrons, and the Ecclesiastical Commissioners hold the great tithes of Bramford and Burstal.

Aveley.—This church is another example of the stone towers of Essex which are to be found on the banks of the River Thames, up which river the stone found an easy means of transit.

Harwich, from its conspicuous and important position, is a town which has witnessed many and great vicissitudes. Situated as it is on an arm of land overlooking the expensive estuary of the rivers Orwell and Stour, the military importance of its position will be easily recognised, whilst its harbour affords convenient anchorage for craft of all sizes. Twelve miles of lovely river separate Ipswich from Harwich, and the trip is easily accomplished by steamers which ply between the two places. Historically Harwich is most interesting. Past it sailed the victorious Vikings and Danes on their way to sack and pillage the town of Ipswich, and many royal personages have landed and embarked from its shore. The earliest recorded royal visit was that of Isabel, Queen of Edward II., who landed in 1326, with a body of insurgents, to oppose the King; and again in 1340, Edward III. embarked to assert his rights to the regal diadem of France, only to return later, discomfited and defeated, to the same port, where he rallied and reorganised his forces and again sailed forth, this time to return a proud victor. Henry VIII., Elizabeth, Charles II., and the two first Georges, all paid visits to Harwich, and William III. passed through twice on his way to and from Holland. Opposite Harwich, on the Suffolk side, is Landguard Fort, of which redoubtable fortification Pepys records in his Diary, the Dutch landed here about 3,000 men and attacked it, but were "beat off thence by our big guns." A walk through the streets of Harwich conveys ample evidence of its high antiquity, and many buildings, both interesting and historical, remain to gladden the heart of the studious and observant. The principal buildings in the sketch are the church and the Great Eastern Hotel. The former is a brick erection, rebuilt on the site of a former ancient edifice, and is a conspicuous mark from land or sea.

John Shewell Corder.

RESTORATION OF ST. ANDREW'S CHURCH, KINGSBURY.

This ancient church, a description of which appeared in the *Builder* some time ago, has now been restored. The chancel has been thoroughly repaired and restored by Mr. Ewan Christian, acting for the Ecclesiastical Commissioners of England; and the rest of the church, including the addition of a new vestry and heating chamber under,—the vestry opening into the church by an arch, in which the organ is to be placed,—has been restored by Messrs. Newman & Newman. The works both for Mr. Ewan Christian and Messrs. Newman have been carried out by Messrs. L. H. & R. Roberts.

Various interesting discoveries have been made during the progress of the works. Upon the south wall of the church being stripped, of plaster internally and cement externally, an old Norman arch was discovered, which has been opened out and carefully restored, and an open-timbered porch is to be shortly erected, the design of which has been taken from an old engraving of Kingsbury church found in the Guildhall Library. In the north and south walls of the chancel, six earthenware square pipes were found, three on each side, laid side by side, with their openings towards the face of the walls, and pierced at the sides by oblong holes opposite to one another. Remains of ancient frescoes were found upon the jambs of the east window, and also upon the other walls of the church, but they were all too much destroyed for preservation in any way. A very small single-light window was found at the side of the priest's doorway, and very low down in the wall. This has been opened out and carefully restored. All the quoins of the windows and doorways throughout the present church are pieces of much older work, which have been turned round and reworked to form the present Late Perpendicular work which exists throughout the church. Some curious dog-toothing was found built into the wall, apparently of a very much richer design than any of the present details of the church. Roman work is plainly visible in some parts of the walls. There also were found two recesses, probably aumbries, each side of the chancel near to the altar, which have been opened out and repaired; both had wooden lintels for their heads, apparently of great age. The curious bell turret at the west end has been left as before, with the exception of the gallery, which has been entirely removed; and it is hoped that before long, when funds permit, the bells will be re-hung, so that they may be rung, which at present is not possible. The roof, which was formerly ceiled in, has been opened out and boarded with oak at the back of the rafters, which are strutted throughout to each rafter; this has made an immense improvement to the interior of the church. At each angle of the building the walls are built upon stones of an enormous size. The external face of the walls has been covered with rough-cast, the quoins being left visible. The tracery throughout has been most carefully reinstated where necessary. The heating has been carried out by the Thames Bank Iron Co., and it is hoped that before long funds will be forthcoming to reseat the church with good oak seats, and that a rood-screen may be erected which formerly existed in the church, and that the font may be recovered, which is now in the garden of a neighbouring house.

The object of these few notes is to show that the restoration has been carried out in a true conservative spirit, all old work being carefully preserved, and the new work being entirely in character with the old, which, we venture to think, will be seen upon reference to the sketches accompanying this description.

Newman & Newman.

ANCIENT SCULPTURE IN BRONZE:

STATUARY.

Mr A. S. Murray, of the British Museum, delivered the third and concluding lecture * on "Ancient Sculpture in Bronze" to the students of the Royal Academy, on the 25th ult. As a preliminary, the lecturer said that he had recently had occasion to examine a number of specimens of ancient silversmiths' work in the British Museum, in company with a skilled silversmith who, with an extensive business on his hands, had yet found leisure to inquire into the processes employed by the ancients, and who, as the result of long experience, declared that there was no process employed now that was not known to and practised by the ancients; we might carry some of the processes further, that was all. The same was true, the lecturer believed, of modern work in bronze; we might carry some of the processes further, but in actual knowledge we had not surpassed the Greeks. Nevertheless, there might be some instruction to be gained by looking back on the early times, when the Greeks were engaged in working out for themselves the problem of how best to execute a work of sculpture in bronze. The oldest example to which he was able to point was a bust which, strictly speaking, was not Greek, it having been found in an Etruscan tomb, and being, no doubt, of Etruscan workmanship of about the year 600 B.C. At that time, however, Etruria and Greece had so much in common in matters of art, or, at least, of artistic processes, that what was true of the one country was true of the other. Moreover, the process by which the bust in question had been produced answered exactly to the literary records we possessed of the oldest statuary of bronze in Greece. It was made of thin plates of bronze, hammered up into some approach to human form, and then fastened together with pins or nails, so as to form a complete bust. There was in Greece a statue made in that manner which Pausanias saw and described, calling it the oldest statue he knew of. So also, at Olympia, there was a famous colossal figure of gold made by the same process at the expense of the ruling family of Corinth, the Kypselidæ, in the early part of the seventh century B.C. Therefore, failing remains of such sculpture from Greece itself, the lecturer thought he was justified in using as an illustration the contemporary bust from Etruria. Perhaps, though, he was wrong in calling it a "bust," because the Greeks did not sculpture busts, in the ordinary sense of the word, till at a late period of their art,—till the time of Alexander the Great and thereafter. The idea of the Etruscan bronze in question,—not to call it a bust,—appeared to have been derived from a class of vases which the Phœnicians were fond of,—tall cylindrical vases, finishing at the top in the form of a bust of their goddess, Astarte or Aphrodite. In the tomb in which the bronze was found there were also discovered two such vases in alabaster, which clearly had been imported from some place where Phœnician influence was powerful. According to tradition, bronze casting was invented or introduced in Greece somewhere about 600 B.C. No doubt casting had been practised long before that date in Assyria and Egypt,—at least casting in the solid. There might be seen in the British Museum bronze statuettes from Assyria, cast solid, and bearing inscriptions which placed their date about 2250 B.C. Possibly there were examples from Egypt also of a similarly high antiquity. But what we had to do with was hollow-casting. With that invention the names of two sculptors were always associated, viz., Theodoros, and Rhœkos of Samos, of whom it was also said that they had studied their art in Egypt. We now knew, thanks to recent excavations, that where they studied was among the Greek settlers at Naucratis, in Egypt. The name of Rhœkos was found inscribed on a vase there, and though it was not necessarily the very name of the sculptor, it nevertheless was to all appearance the name of some one from the same locality of Samos at that time. We might, therefore, take it that it was not directly from the Egyptians proper that Theodoros and Rhœkos learned the art of hollow casting in bronze. It was in the first instance from their kinsmen in Naucratis. Diodorus Siculus (i., 98) described a specimen of casting by Theodoros and Rhœkos in the form of a statue of Apollo in Samos, and claimed the original invention of the method for the old Egyptians. He said that the statue was made in two parts, divided vertically, each part consisting of a leg and half the torso. It was to be presumed that the two parts were brazed together by solder, a process which had been invented some time before by an artist named Glaukos, of Chios. This invention, coming as it did before that of casting, was hailed as an extraordinary advance on the old cumbersome method of fastening the parts together by pins or rivets, as in the Etruscan "bust" first mentioned, and in numbers of archaic bronze vases. Having described a great bronze vase which was placed in the Temple of Hera, in Samos, apparently about the time of Glaukos (Herodotus, iv., 152),—there being underneath the vase a stand formed by three figures, each 10 ft. 6 in. high,—the lecturer, passing on to the period about 500 B.C., said that we were now, thanks to the recent excavations on the Acropolis of Athens, fairly well informed as to the condition of sculpture in marble at that time. We saw from a number of statues found there that the prevailing taste was for gracefulness in demeanour and costume. That this was the prevailing taste also among the sculptors in bronze of that period was confirmed by a number of statuettes found at Olympia some years ago. When we reached the great age of sculpture in bronze,—the age of Polycleitos, Myron, and Pheidias, it was possible, by a laborious study of literary traditions, of contemporary works in other branches of art, and of copies made and modified in later times, to form perhaps a fair conception of what the works of those great men were like. But it was not possible, the lecturer thought, to express that conception in a way that would be intelligible without going over most of the details,—without, like a lawyer, calling endless witnesses to prove countless points, only, perhaps, to fail in the end. At the same time, there was in the British Museum a comparatively recent acquisition, which, though it was only a fragment, would at least serve to indicate what was the general character of the art in bronze of those great times. He referred to the leg of a bronze statue, over life-size, of which Mr. Poynter had written that it was "of unsurpassed workmanship, and of that culminating period of art when, having freed itself from the archaism which hampered expression, it still retains that severity of style which shows that the idea to be expressed is still the dominant one in the mind of the artist, and that the study of beauty and the utmost skill of workmanship were still to him the means to an end, that is to say, of glorifying to the highest point the subject on which he was engaged." After a brief sketch of the steps by which art advanced in the early times of Greece, Mr. Poynter proceeded to say that "the grand simplicity of treatment which we find in the works of the Pheidian age was not the result of a conscious endeavour to simplify or conventionalise nature into typical forms; it was, so to speak, inherent in the archaism which the art had hardly shaken off; it was the still lingering tradition of the imperfect art which saw only generic forms and received only generalised impressions from nature. It is precisely at the point when this sense of the exalting value of noble and beautiful form flashed like an inspiration from heaven on the Greek school that the culmination of art was reached. Of such a period was the heroic figure whose leg we are considering. . . . . . Vigour and elegance of line; firmness of form; complete expression of all the subtleties of life and movement, yet with no insistence on trivialities of detail; perfect symmetry and proportion; and, as I have said, workmanship of unsurpassed beauty, are all combined in this superb fragment, which seems to me second to nothing which the Museum already possesses. The finish is that of a gem or a coin, while the largeness of treatment is such that it might have been hewn with an axe; and the play of the muscles is as full of spring and elasticity as life itself." The lecturer passed on to speak of the next stage of sculpture in bronze, as represented by the head of Hypnos, in the British Museum, which was quite possibly the head of Hypnos which Pausanias saw in a temple at Sikyon, in Greece. It was found near Perugia, in Etruria, having been carried away from Greece by some Etruscan. It had been proposed to regard this head as a work of the time of Praxiteles, and there was much to be said for that view. After Praxiteles, the next great sculptor was Lysippos, in whose work there was to be found an excess of energy, the accompaniment of a period when the national life was sinking, though individuals here and there towered above it. Some bronze statuettes now in the British Museum, and found not far from the seat of the ancient oracle at Dodona, in Northern Greece, served to illustrate his manner. After his time, the sculpture of statues in bronze took much to figures of colossal size. Mr. Murray brought his lecture to a conclusion by some remarks on the ancient processes of gilding and enamelling on bronze.

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* For reports of the previous lectures see *Builder*, pp. 145, 202.

THE ENGLISH RENAISSANCE.

Sir,—Permit me to reply to Canon Venables' letter in your issue of last week, and to assure him it was not any want of appreciation of Dance's work at the Mansion House, but simply lack of time, that made me unable to refer to it more fully in my paper at the Association. I found that the seventeenth-century works had taken up so much space that I had little left in which to do justice to those of the eighteenth century, and amongst others, the Mansion House; but in the course of the evening, when drawing attention to the character of the woodwork in the old City halls, I also referred to the admirable woodwork in the Mansion House, especially in the ball-room, which, like much of the work in the building, is full of the particular charm of English Classic.

It was in no sense derogatory to Dance that I told Ralph's story about Palladio, but simply for what it was worth in the way of "humour"; on the contrary, I am glad an English rather than an Italian design was adopted, and quite agree with Canon Venables in his dissent from the "vituperation" to which it has been subjected from time to time. It is the work of no novice, shipbuilder or otherwise, but of a man who thoroughly understood the spirit of the style as then practised.

I should like to thank Canon Venables for the interesting particulars he gives in his letter, and to suggest to you, sir, the illustration of the Assembly Rooms at York as a charming example of English Classic.

While I am about it, let me acknowledge Mr. Ward's correction regarding St. Paul's in the

Builder of the 9th inst.; but, after all, it amounts to much the same thing. Compton was practically the *one* Bishop from start to finish, and *one* firm of builders built the cathedral, though it was begun by the father and finished by the son, which, with the *one* architect, are undoubtedly remarkable circumstances in every way. J. M. BRYDON.

March 18, 1889.

THE "CATES" PARIS STUDENTSHIP.

SIR,—I think your correspondent "Prudentia" need have no misgivings as to a probable paucity of candidates for the above, as I already know of more than the stipulated number, who are intending to enter the lists. The condition referred to was laid down by the express wish of the donor.

FREDERIC R. FARROW,
Hon. Sec. Architectural Association.

RUSTLESS IRON.

SIR,—As an old reader of the *Builder* I have read the article on the above subject in your issue of the 2nd inst. [p. 165] with interest, and as I have some knowledge of this matter I take the liberty of trespassing on your space with a few samples of work treated by the late Professor Barff's process. I will first say I have a few little articles given me by Mr. Barff himself when I visited some works at Kensington with him, I think in 1878. There are the hinges, latchwork, lamp brackets, suspenders, and altar-rail standards at Holmbury St. Mary church, as built and given by the late G. E. Street. At Kingston Church, in Dorsetshire, there is a fine wrought-iron pulpit, altar-rail standards, hinges on the doors, and casement at the Vicarage, all treated with the same process. In London, at the Guards' Chapel, there are the altar-rail standards and rails, all wrought iron, also the chancel gates. These have, I believe, been decorated since, so that one may form an opinion as to ground for decoration. These are works of all of which I have a personal knowledge, and some of them are the work of my own hands.

The great feature to my mind is that the work of the blacksmith's hammer is as definite after treatment as before, which is largely lost in painting, however carefully done.

The one thing to be observed is very careful treatment afterwards, as the heating process anneals the iron, and thereby softens the same.

As in the case of hinges, care should be taken not to overdrive the nails, as the oxide chips off all round the holes, and leaves these parts to rust badly.

Scrolls, &c., should not be bent about more than can be helped, as the oxide will crack and chip, thereby causing spots of rust to appear.

JOSEPH H. BARFORD.

The Architectural Association. — The eleventh meeting of this Association for the present session was held on the 15th inst., in the meeting-room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair. The following gentlemen were elected members of the Association, viz.: Messrs. F. Galsworthy and H. D. A. Harding. Mr. Owen Fleming moved the following resolution, of which he had given due notice:—

> "That the Architectural Association views with great regret the agitation for the demolition of the Church of St. Mary-le-Strand, and desires to enter an earnest and emphatic protest against any such demolition, as being not only utterly uncalled-for by the requirements of traffic, but also a wanton destruction of one of the finest examples of the work of that eminent architect, James Gibbs, forming, with the buildings around it, one of the most beautiful and picturesque architectural groups in London."

Mr. C. H. Brodie seconded the motion, which was passed unanimously, and copies were ordered to be sent to the London County Council, the Strand District Board of Works, and the Rector of the Church of St. Mary-le-Strand. Mr. A. B. Pite then read a paper on "The Design and Manufacture of Wall-Papers." We are compelled, owing to the amount of space taken up by Mr. Blashill's paper on "Doors," and its accompanying illustrations, to hold over Mr. Pite's paper, and the report of the discussion which followed it, until next week, when we will give them, with a few of the illustrations.

Death of Mr. S. C. Hall.—We regret to have to announce the death of Mr. Samuel Carter Hall, F.S.A., which took place on Saturday last. He had nearly reached the completion of his eighty-eighth year. He was for many years editor of the *Art Journal*, and was a contributor to the *Builder* many years ago.

CHURCH-BUILDING NEWS.

Heanton Punchardon.—On Shrove Tuesday the Parish church of Heanton Punchardon, near Barnstaple, was reopened, with a sermon by the Bishop of Exeter, after partial renovation. It is an ordinary Devon church with chancel of fourteenth century date, of which only the proportion and none of the details remain; a nave with south porch, and north aisle extending one bay on to the chancel; a north-east vestry; and a fine western tower, well built, but with pinnacles inclining outwards, whether purposely or not, over the angles of the tower. Debt has been scrupulously avoided, and nothing therefore has been done to the roofs, which are in a bad state of decay, but the western tower has been put into a state of repair, and its six good bells have been re-hung at the expense of Sir William Williams. Some of the old windows had been made up, principally with cement; others were of wood, painted and sanded to imitate stone. These have been renewed in Ham Hill stone. The old paving-stones and monumental slabs have been relaid in their old positions, the intermediate spaces being made up with tiles; and wood-paving blocks have been laid under the open benches. These are of pitch-pine, commodious and comfortable, with cut and deeply-moulded elbows. The chancel had been shortened and cramped by the removal of the old carved oak screen one bay eastwards. This has now been replaced in its old position, on the original step, and is being continued across the aisle. Oak stalls, with cut and moulded ends, have been provided for the chancel. The work in the chancel has been done at the cost of the present rector, the Rev. Charles E. Lamb. The work has been carried out by local tradesmen, without a builder, under the direction of Mr. William White, F.S.A., architect.

Horwood (Devon).—At the parish church of Horwood, Devon, now being restored by Mr. W. Dart, of Crediton, the workmen have discovered two interesting piscinæ,—one in the south chancel wall, the other in the north chancel aisle. The former is most unique, and probably dates from the thirteenth century. Other beautiful remains of stone and woodwork have been brought to light. The architects for the restoration are Messrs. Hayward & Tait, of Exeter.

Leamington.—A tower and spire have been erected for the Church of St. John the Baptist, at Leamington. The spire rises to the height of 175 ft., and is built mainly of brick. It is a broached spire, with pinnacles and lucarnes, and surmounts a tower, with belfry, stage, and buttresses. It is in the Transition style, from the thirteenth to fourteenth centuries, and, together with the church, was designed by Mr. J. Cundall, A.R.I.B.A., and was carried out by Mr. G. F. Smith, builder, Leamington.

Mytholmroyd.—The Church of St. Michael, Mytholmroyd, which has been enlarged and restored, was recently re-dedicated by the Bishop of Wakefield. Messrs. T. H. & F. Healey, architects, of Bradford, prepared the plans for and superintended the alterations. The church had a north aisle and chapel, and it was decided to add a south aisle and chapel, and thus give to the building its proper proportions. It was also decided that the chancel should be pulled down, and rebuilt on a larger scale, so that a clergy and choir vestry, as well as an organ-chamber, might be added to it. In addition to these alterations, it was resolved that the church should be re-pewed and re-lighted throughout, and a new heating apparatus provided. The contracts were let to the following firms:—Mason, Mr. B. Lumb, Todmorden; joiners, Messrs. Halstead Brothers, Eastwood; plumber, Mr. J. Greenwood, Mytholmroyd. The total cost of the works now carried out will be upwards of 2,000*l.*

Rishton (near Blackburn).—The Church of SS. Peter and Paul, Rishton, has been reopened, after being closed for a period of nine weeks, during which it has undergone a thorough decoration. The work has been carried out from drawings prepared by Messrs. Simpson & Duckworth, architects, Blackburn, by Heighway & Son, decorators, Manchester, under the direction of the Church Committee. The general scheme of colouring is in light and warm tones, in harmony with the prevailing tints of the stonework. The nave and aisles are painted in light terra-cotta, with cream bands and stencilled ornaments, the transepts being more elaborately decorated. On the east wall are painted full-size figures of the patron saints on gold ground panels; the wall under on each side of the reredos is hung with rich tapestry. The cost of the decorations has been about 250*l.* A new organ has been erected by the firm of Forster & Andrews, Hull, at a cost of over 600*l.*

STAINED GLASS.

Bath Abbey.—The *Bath Chronicle* reports that, by the munificence of Miss Little, daughter of the late Mr. Bartlett Little, the entire northern half of the west window at the Abbey has been filled with stained glass by Messrs. Clayton & Bell, of London, in accordance with their design. Nine lights are now occupied by the following subjects:—Joseph sold by his brethren, Joseph interpreting Pharaoh's dream, Jacob blessing his children, Moses delivering the Law, the building of the Tabernacle, falling of manna, Balaam and his ass, Moses and Joshua before the Ark, Deut. xxxi. 14, and Moses delivering the Law to the priest, Deut. xxxi. 26. Above, the tracery has been treated so as to correspond with the lights below. The total cost has been about 400*l.*

Llangorven.—The two large west windows of this parish church have been filled with stained glass, from the studio of Messrs. Chas. Evans & Co., of Warwick-street, Regent-street, as a memorial to Miss Katie Francis, of Wallog. The windows are exceptionally rich in detail, and amongst other subjects are illustrated the parable of the "Good Samaritan," the "Marys at the Tomb," "Visiting the Sick," and "Christ rebuking Martha." The windows are thirteenth-century in character.

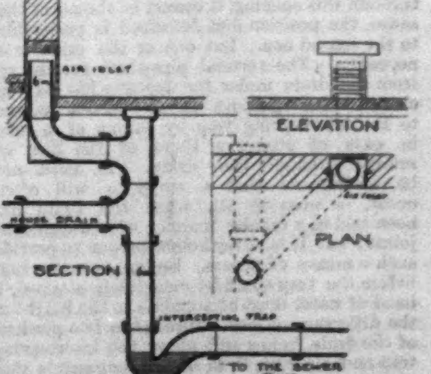
Wednesbury. — Another two-light painted window has recently been erected in this parish church, in memory of the late Mrs. Knowles. The texts illustrated are, "He is not here, but is risen," and "Mary hath chosen that good part." The artists were Messrs. Charles Evans & Co., who erected the Tuthill Memorial in this church.

The Student's Column.

TOWN DRAINAGE.

XII.—VERTICAL AIR INLETS TO A HOUSE-DRAIN.

THE air inlet to the drain of the detached house in the sketch-plan of the last article may be the same as that shown in the detailed drawing of article viii. (see p. 151 *ante*), as it would not be in a roadway; but for small houses in a row, similar to those shown in the other sketch-plans, it would be inappropriate, inasmuch as it would be in the footway of the street. This makes it necessary to introduce the air through a vertical opening. The vertical form of opening is appropriate for any house, large or small; but in large houses, with open ground in front, a horizontal inlet may be adopted. The horizontal inlet admits the air with less obstruction, and is, therefore, preferable; but for small houses, such as those shown in the last article, and for small houses generally, the vertical opening is the only one which is practicable. We have said before that in a roadway or footway an open grating should have a dirt-box suspended under it, but that with a pipe inlet this cannot be adopted, because it fills up too much of the airway. The vertical grating is, therefore, preferable in this case, and should be built into the wall, so that it cannot be removed, mischievously or otherwise. Its bars are hori-



zontal, 1 in. square, with spaces of 1¼ in. The bars do not extend to the top of the casting, which is 12 in. high, but only to the height of 8 in., there being a dead-plate 4 in. deep at the top. The bottom of this plate, which forms part of the casting, is 2 in. below the top of the air-inlet pipe, and there is a space of 2 in. between the top of the pipe and the underside of the stone lintel, which covers the opening in the wall. It is 9 in. wide, or of the thickness of the wall, whatever that be, and of the depth of a course of bricks. A brick in length of the wall is left out, to form an opening for the 6-in. pipe. Under the footway, immediately in front of the house-wall, a 6-in. pipe is brought up vertically from the drain-trap, to within a few inches of the surface, and covered by the street flagstones or other pavement. There is a branch on this vertical pipe, turned in the direction of the air inlet, and from this branch 6-in. pipes, with proper bends, are set and jointed, terminating at a level 2 in. below the underside of the stone lintel in the wall which covers it and the vertical grating. Pipes are made in various short lengths to suit this and other purposes; but in the absence of these, the pipes can be cut to the exact length required in every case. The dead-plate at the top of the grating, and in front of the top of the air-inlet pipe, is for the purpose of preventing the top of the pipe being reached. Such little things as these, with others, have to be considered in laying house-drains in some situations. The bars of the grating are horizontal, for the reason that it is more difficult to reach the top of the pipe through them than through vertical bars. The area of all the openings is 35 square inches,—only one-fourth more than that of the pipe; it would be better 50, if it were practicable. The position of the air-inlet so near the doorway and the window in front of the house would be objectionable if, instead of the air passing inwards, it should pass outwards through the grating; but the provision of a ventilating outlet-pipe at the head of the drain, carried up to a level much above the inlet, has the effect of inducing the passage of air inwards through the air grating; and it is, at any rate, the only position within the rights of the owner of the house.

If the footway in front of these houses has a deep curbstone, and if the street authority give permission to the owner of the house to place the air-inlet to his drain in its vertical face, by substituting for a part of it an iron casting containing the requisite grating and continuation of the surface of the curbstone in one, this position may be adopted instead of the one above described. It is a very old method of admitting the water of the street channel to the pipe which conveys it to the sewer, to provide such a vertical opening in the line of the face of the curbstone, where it is deep enough, to take the excess of rain-water which cannot pass through the ordinary horizontal gully grating of the street channel, and the same form of opening, with a grating, may be adopted for the air-inlet to a house-drain, which may be directly over the drain or not, at convenience; but it is not within the power of an owner of a house to place it there; and if so placed, it cannot be so well protected as in the other position; and, seeing that the air-inlet is above the intercepting-trap, and that, therefore, though by chance air might flow outwards instead of inwards through this opening, it cannot be the air of the sewer, the position first described is preferable to the second one. But one or the other is a necessity. The vertical pipe-shaft carried up from the drain under the footway has its top closed. Its purpose is to permit access to the intercepting trap by means of a rake in case of stoppage there of the flow of sewage through the drain. It need not be anticipated that a stoppage will often occur, or even at all, when the drain has been laid in a regular manner with water-tight joints; but it is nevertheless proper to provide such a means of access. Seeing, however, that before the trap could be completely stopped, a head of water must accumulate to the height of the difference of level between the two portions of the drain, below and above the intercepting trap and air inlet, it is almost impossible that this pressure of water should not force through the trap everything which can come into it. In the figure this difference of level is 3 ft. It may often be less than this, but may in nearly all cases be made sufficient, even though considerably less than that here shown.

Books.

Ein Rundgang durch die Ruinen Athens. Von Dr. Fritz Baumgarten. Mit 10 Abbildungen. Leipzig: Hierzel, 1888.

We are glad to welcome the second edition of a very useful little book which, in its first issue, escaped our notice. Dr. Baumgarten has put together, in the very limited space of eight pages, just the amount of information about the topography and monuments of Athens that the intelligent traveller who is not a specialist, or the ordinary educated reader at home, wants to have at hand. As a schoolmaster, he has specially had in view the wants of boys who are reading classical authors, but his book is sure of a much wider public. It is based, as every work of the kind, however elementary, must be, largely on the narration of Pausanius. References to modern authorities for particular views are advisedly not given. In a book of this kind they are out of place, but, as foot-notes, references to the principal classical passages are added. The few wretched illustrations might as well have been omitted; but there are four valuable plans, showing the latest discoveries. In the plan of the Dionysiac Theatre it is a pleasant surprise to find the old orchestra recently discovered by Dr. Dörpfeld clearly marked. It is somewhat strange that a discovery so important should first appear in a plan made for a book so obviously popular. On the same plan (which includes the Acropolis) the Chalkotheke is marked (though with a query) in its wrong place, and the precinct next to that of Artemis Brauronia bears the name, now known not to be authentic, of Athene Ergane. But these are trifling matters, to be altered in another edition; the wonder only is that, as Dr. Baumgarten has not himself been to Athens, the book is so well posted up to date. We can only hope that shortly some master of an English public school will prepare a similar book for the use of his pupils.

Rates and Charges on Railways and Canals. By Percy Gye and Thos Waghorn. London: Waterlow & Sons. Price, 2s.

In congratulating ourselves upon the setting at rest of various troublesome railway questions by means of the Railway and Canal Traffic Act of 1888, it would appear that we have been rather too premature. According to the writers of the treatise under notice, the Act just completed with so much care, and after so much deliberation and discussion, is as vague and indefinite in some of its most important provisions as are its predecessors. For instance, we read, "There are clauses directly dealing with the subject of undue preference, but, in common with the remainder of the Act, they ring with a very uncertain sound." The fact is, the legal mind can discern so many meanings to a word or a phrase, that we need not feel much surprise that our authors, contemplating from the Inner Temple the future working of this Act, should "scent the battle from afar." We are also warned in passing, not to place too much reliance upon the Act as a means of cheapening procedure. "Until Parliament by its fiat can order that which is abstruse to become simple, and can compel the services of the leaders of the Bar gratuitously for the benefit of oppressed traders, the inexpensiveness of the Railway Commission must perforce remain in its state of recommendation as at present."

Assuming this view of the "uncertain ring" of the Act to be correct, one's feelings of disappointment are naturally succeeded by stirrings of indignation against the draftsmen entrusted with the preparation of the clauses. But our authors promptly interpose to shield those officials, attributing the defects of the measure to the want of machinery for passing any comprehensive and consistent scheme through Parliamentary Committees. We are also told that "however perfectly a Bill may be drawn for presentation to Parliament, a few injudicious amendments in Committee will relegate the whole matter to its original obscurity." Why, we were always under the impression that the removal of ambiguity and the dispelling of doubt and uncertainty was one of the chief aims of Committees. During the passage of a measure through its various stages, objections are frequently disposed of by the assurance that all little doubts and inconsistencies will be rectified "in Committee." Now we are told that this is all a delusion and a snare!

This treatise is a less pretentious work than some which have appeared on the same topic, but there is much information in its pages which will prove of service to those interested in the subject.

Practical Plane and Solid Geometry, Scales, and Pattern Drawing. Revised and enlarged edition. By John S. Rawle, F.S.A. London: Simpkin, Marshall, & Co.

This small book contains a great deal of information crowded into a small compass, the problems being described in the briefest possible language, and with illustrations just large enough to give their meaning without taking up any unnecessary space on the page. A direct practical application of geometry to architectural drawing is made in regard to the manner of drawing various foiled figures within assigned spaces, and in regard to geometrical pattern-drawing on a more elaborate scale. A great many notes are appended to the problems, suggesting further applications of them, or considerations arising out of them. The book is very small and compact, and crammed with information.

Elementary Building Construction and Drawing. By E. J. Burrell. London: Longmans, 1889.

Although the author of this work modestly states in his preface that it is primarily intended for the use of those preparing for the examinations of the Science and Art Department, we are disposed to think that it will have a wider circle of readers. Admirable as are the three volumes of "Building Construction" published by Messrs. Rivington, their price is such that many an architectural student prefers to consult them in libraries rather than to purchase them, but when he finds that he can obtain for half-a-crown an excellent practical text-book of building construction, full of illustrations of working details, clearly engraved and accurately dimensioned, he will have no excuse for not possessing a copy. Only the elementary operations of the builder are dealt with, but these are very clearly explained. In the bricklayers' trade the different kinds of bond, arches, footings, &c., are described and illustrated. Details of the various kinds of stone walls are given, and the proper way of bedding stones in staircases, cornices, &c., is pointed out. We are surprised, however, after the publicity which has been given to the numerous experiments that have been made in this and other countries on the effect of bedding lead between the joints of stones, that its adoption should still be recommended. It is now clearly proved that the use of lead for this purpose is greatly to be condemned. We also think that the remarks on the stone copings of steep gables are not so clear as they might be. The passage now reads as if the author were of opinion that the use of kneelers is only alternative to that of dowels, whereas we hold very strongly that in such positions the coping stones should never depend upon dowels alone, and that kneelers are indispensable. The chapters on carpentry and joinery appear excellent, as well as those on plumbing and slating.

The chapter on iron beams rightly insists upon the urgent necessity of covering such beams with some non-conducting material if safety from fire is to be insured; but the remarks on the behaviour of beams under loads in different positions are too scanty to be of much use. We notice also one very decided error; it is stated that if a beam *supported* at the ends will sustain a load of four tons concentrated at the centre, the same beam *firmly fixed* at the two ends will carry a concentrated load of eight tons. This is quite wrong, as it would only carry six tons. The simpler forms of iron roof are clearly described, and the book closes with some concise remarks on the materials used in construction. The publishers are to be highly commended for the excellence of the working details which are given, and their value is enormously increased by the figured dimensions which are attached to them. We should add that a number of exercises bearing upon the subject matter are given at the end of each chapter

Practical Elements of Construction. By Percy L. Addison, F.G.S. London: Elliot Stock, 1888.

When an author frankly states in his preface that he has submitted the MS. to two competent judges, both of whom condemn it as unfit for publication, a reviewer hardly knows which to admire more, the candour of the avowal or the faith of the author in his own opinion. The work professes to be a reference book for engineers and builders, and comprises notes on railway surveying, wing walls, girders, foundations, &c. The author has evidently a wide practical acquaintance with the subjects of which he treats, but more than this is required for the preparation of a book of reference on technical and scientific subjects. We should be sorry to say that no one would find the work useful, but we think the number of readers who would do so is very limited, and, on the whole, we are disposed to agree with the opinion of the experts referred to in the preface.

Museums and Art Galleries. By Thos. Greenwood, F.R.G.S. (London: Simpkin Marshall & Co. 1888.)

The object of the writer of the above work is to urge upon the nation at large the necessity for providing in each of the great labour centres museums and free libraries; upon Government officials abroad the duty of contributing to the collections at home; and upon curators and librarians the desirability of an exchange of objects of special interest, and the distribution of duplicate specimens.

The whole system should, the author thinks, be placed under a Minister of Instruction, and the separate trusts for the British Museum, the South Kensington Museum, &c., be subject to a single administration.

The author is strongly impressed with the moral uses of such institutions as he advocates, and traces in the diminishing statistics of crime of all kinds their immediate influence.

The body of the work consists of descriptions in detail of the foundation, scope, and peculiarities of many of the most important museums and art galleries in the kingdom,—in some cases illustrated by very poor woodcuts of the external aspect of the building, and less frequently by useful plans. The really magnificent art gallery at Birmingham is awarded the palm as "the finest art gallery out of London," Leeds, Manchester, and Liverpool possessing almost equal claims upon our regard.

The author is severe upon the Scottish apathy where Art is in question, and he is especially severe upon Glasgow. It is strange he should have made no mention of the Museum and Art Gallery at Stirling, the gift of a citizen, and excellent in every way.

An appendix contains the various Acts of Parliament in connexion with the subject, a form of bequest as a guide to the philanthropist, and a collection of the opinions of eminent men on the advantages of the institutions advocated.

Mr. Froude says that free libraries which contain the *right books* are of immense value; but that at present the most absurd books are the most in request; while Mr. Gladstone is credited with the following oracular dictum:—"A Free Library is of great importance for maintaining the knowledge and guiding the life of those who can use it, *even* though they may not represent the entire population!"

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

3,634, Door-fastenings. W. Fraser.

In order to make the closing and locking of a door noiseless, a small wheel with wings is, according to this invention, secured to the striking-plate. This acts similarly to a turnstile, being only permitted to revolve in a forward direction. The bolt of the lock does not require to be pushed in or back; the moment it comes in contact with the turnstile, or rather with one of the wings of it, the bolt causes the wheel to turn partly round. It will continue to turn until the door is hard up against the stop, then the wheel drops into notches on the upper side of the bottom plate or bracket. The door can only be opened when the bolt is drawn entirely back.

5,601, Gas Soldering-irons. F. McCulloch.

According to this invention, a rubber tube and a "Bunsen" burner are used. Into one end of the tube is screwed a tubular head or bit-holder, having formed on its upper side two arms or jaws for holding the bit, which is preferably adjusted by means of a pin or screw. The tubular head is so bent downwards as to allow the flame issuing therefrom to play upon the point of the bit and keep it heated. This bit is provided with a hole for the passage of the screw or pin holding it to the arms, and, by taking it out or unscrewing the pin, the bit may be removed and a different bit inserted. A small pilot or touch-light is provided, so that the irons can be used at a moment's notice. A rest, or support, is designed to receive the soldering-irons when not in use, and this rest is preferably made hollow to receive the bit.

5,728, Water-waste Preventers. O. Elphick.

All valves are dispensed with in the invention which is the subject of this patent. Around the outlet-pipe is a cylinder closed at its lower end where it is fixed to the bottom of the tank, and projecting upwards to just above the top of the tank. Inside this cylinder is a cone or funnel, fitting it at the top and descending into it some way below the top of the outlet-pipe so as to form a trap. Fitting loosely on the outside of the cylinder is a second cylinder or bell closed at the top and connected to the lower handle or other actuating mechanism. Sufficient space is left between the bottom of this bell and the fixed cylinder to allow the water to flow freely between them. When the bell is depressed by the handle, the air in the top is compressed, and passes down the funnel up through the water at the bottom of the fixed cylinder and out through the outlet-pipe. When the bell is again raised, a vacuum is formed, drawing in water from the tank, which, rising above the top of the funnel, flows down it and produces a syphon action by which the tank is emptied down to the level of the bottom of the bell, sufficient water remaining in the bottom of the fixed cylinder to form a trap to the bottom of the funnel.

10,515, Window-glass Setting. J. V. Auth.

The object of this invention is to provide a simple and cheap method of permitting the expansion and contraction of glass or lights used in windows, and security in setting and handling the glass. An india-rubber cushion of U form is drawn over the edges of the glass, and it is claimed that should the plate of glass thus set up or placed in a window-frame expand when subjected to a very high temperature, the rubber will yield, and thereby prevent serious damage to the glass, or should the building settle or the frame warp, the glass will be protected from breakage.

14,674, Appliances for payment of wages. D. W. Bundy.

According to this invention, small flat money boxes are provided on which is marked the name or number of the *employé*. These fit into trays, which again fit into nests or cabinets, and arrangements are provided by which the whole apparatus is locked and rendered safe for transit.

12,862, Sash-fasteners. T. Parkes.

According to this invention, a bolt is constructed, cylindrical wedge shape, which moves in a case or frame having a slot in the upper surface. The case or frame is cast in two half-circles; the one secured to the bolt is slotted, and the other has an aperture to receive the bolt when moved forward in locking the two sashes together. Each half of the case is cast in metal separately, and the separate parts are afterwards riveted or screwed together as required.

NEW APPLICATIONS FOR PATENTS.

March 4.—3,758, W. Dowland, Plane-iron for Carpenters, &c.—3,763, W. Mitchell and W. Hare, Chimney-cowl.

March 5.—3,833, T. Kemp, Testing House Drains.—3,851, H. Hellewell, Chimney-top, &c.—3,872, L. Cadwell, Pavements, &c.—3,876, B. Finch, Smokeless Stove.

March 6.—3,893, W. Johnson, Pressing Sand-faced Bricks.—3,925, R. Capstick and H. Pinchon, Self-locking Sash-fastener.—3,970, E. Matheson, Tiles, and Fixing same.

March 7.—4,005, J. Hall, Norfolk Latches.—4,009, W. Henderson, Window-sash Furniture.

March 8.—4,065, W. Davidson, Fastenings for Rain-water Pipes, Soil-pipes, &c.—4,076, J. Taylor, Self-closing Doors.—4,079, J. Brundrett, White-wash Brushes, &c.—4,087, F. Lane, Horizontal Saw Frames.

March 9.—4,147, F. Harbidge and E. Nowell, Combination Carpenter's Square, &c.—4,161, A. Hince, Sash-fasteners.—4,174, F. Vine, Burglar-proof Fastenings for Windows.

PROVISIONAL SPECIFICATIONS ACCEPTED.

624, C. Thode, Automatic Door Hinge and Check.—1,623, W. and C. Chandler, Flushing Cistern.—1,888, J. Cole, Ventilating Hook for Sashes.—2,321, P. Aherne, Window-fastener.—2,347, J. Gunter and J. Langer, Girders and Channels.—2,531, G. Newman, Spring Hinges, &c.—2,692, W. Poole and A. McDonald, Testing Drainage Pipes, &c.—2,741, G. Newman, Door Springs and Checks.—2,862, H. Lake, Water-closets.—2,993, J. Mathieson and others, Stoves and Cooking Ranges.—3,076, W. Cowan, Syphon-flushing Cisterns.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,207, G. Arnold, Joint Connexions of Sanitary Drain-pipes, &c.—6,651, T. Twyford, Flushing Cisterns.—6,712, J. and B. Craven, Machines for Pressing Bricks, &c.—6,960, W. Scott-Moncrieff, Grease Interceptors for House Drains, &c.—14,173, W. Dawson, Window-sashes.—1,874, D. Hoey, Revolving Cowls, &c.—2,239, W. Blakely, Protecting Timber from Decay.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

[*Contractions used in this list.*—"g.r." for "ground-rent"; "yrs." for "years"; "st." for "street"; "rd." for "road"; "sq." for "square"; "pl." for "place"; "ter." for "terrace"; "yd." for "yard," &c.]

March 11.—By J. C. Platt.	
Hammersmith—16½, Bridge-rd., 49 yrs., g.r. £3. 19s. 6d.	£375
29, Bridge-rd., 50 yrs., g.r. £5. 12s. 6d.	505
85, Bridge-rd., 46 yrs., g.r. £4	375
March 12.—By Debenham, Tewson, & Co.	
Cheshunt, Crouch-la.—A cottage and 5a. 2r. 29p.	300
Camden-road—Improved g.r. of £13, term 53 yrs.	245
City-road—Improved g.r. of £12, term 35 yrs.	200
Homerton—Improved g.r. of £147. 14s., term 5 yrs.	600
Hoxton—Improved ground-rent of £10, term 17 yrs.	110
Holloway—18 and 26, Lowman-rd., 75 yrs., g.r. £12. 12s.	610
61 to 75 odd, Crayford-rd., 77½ yrs., g.r. £36	1,915
By Giddy & Turner.	
Limehouse—63, 65, and 67, Salmon's-la., copyhold	1,000
By W. Holcombe.	
Marylebone—72 & 74, Richmond-st., 33 yrs., g.r. £16	380
90 and 88, Richmond-st., 33 yrs., g.r. £14. 5s.	420
By Bean, Burnett, & Co.	
Marylebone—31, Saville-st., 30 yrs., g.r. £12	1,070
Sydenham—Ground-rent of £56 a year, reversion in 88 yrs.	1,300
Wandsworth—Ground-rent of £13. 10s., reversion in 87 yrs.	310
Ground-rent of £90. 10s., reversion in 87 yrs.	2,210
Walham Green—Ground-rent of £36, reversion in 97 yrs.	785
Finsbury Park—Ground-rent of £25. 4s., reversion in 93 yrs.	550
Hornsey—Ground-rent of £25. 10s., reversion in 98 yrs.	510
March 13.—By H. Donaldson.	
Hackney-road—No. 365, term 27 yrs., g.r. £5. 6s. 6d.	390
Stoke Newington—1, Gordon-rd., 71 yrs., g.r. £6. 6s.	600
By L. J. Fraser.	
Romford—The "Laurie Arms" tavern, freehold	915
Bethnal-green—31 to 37 odd, Coventry-st., freehold	1,150
39 to 45 odd, Coventry-st., freehold	855
5, 7, and 9, Northampton-street, freehold	800
32, Coventry-st., freehold with possession at Christmas, 1893	130
By Inman Sharp, Harrington, & Roberts.	
Portland Estate—5, Weymouth-st. and stabling, 38 yrs., g.r. £60	1,320
30, Wimpole-st., 32 yrs., g.r. £80	3,300
13, Margaret-st., 42 yrs., g.r. £28	1,460
59, Margaret-st., and 1, Margaret-court, 33 yrs., g.r. £15	1,300
62, Margaret-st., 35 yrs., g.r. £50	1,520
9, Margaret court, 35 yrs., g.r. £4	710
6, Margaret-court, 40 yrs., g.r. £6	680
190, Oxford-st., and 28, Market-pl., 64 yrs., g.r. £200	6,000
Newington Causeway—Nos. 73 and 75, terms 29 and 34 yrs., g.r. £55 and £36; also the freehold reversion to two-fifth shares of No. 75	1,850
Clerkenwell—129 and 131, King's Cross-rd., 52 yrs., g.r. £15	940
Fitzroy-square—8 and 9, Charlton-st., 23 yrs., g.r. £56	860
Marylebone—38, Upper Marylebone-st., 8 yrs., g.r. £30	250
March 14.—By Dale & Son.	
Mile End—1, Grafton-st., 57 yrs., g.r. £4. 10s.	385
Mile End-road—No. 400a, the lease of, term 10 yrs.	130
By E. J. Gairdner.	
Holloway, Burnard-ter.—Ground-rent of £3. 15s., reversion in 57 yrs.	105
Ground-rent of £19, reversion in 57½ yrs.	535
Ground-rent of £7. 10s., reversion in 58½ yrs.	265
Wandsworth-road—"Crown and Anchor" beer-house, freehold; and an annual rent of £1, term 40 yrs.	1,220
By C. C. & T. Moore.	
Mile End—45, Lindley-st., 11½ yrs., g.r. £2. 5s.	60
By H. J. Bliss & Sons.	
Victoria Park—4, 5, and 7, Shafton-rd., 57 yrs., g.r. £12. 12s.	885
26, Groombridge-rd., 64 yrs., g.r. £6	335
By E. Stimson.	
Camberwell, Smith-st.—Crown Cottage, freehold	800
83, Camberwell New-rd., 13 yrs., g.r. £1	255
Battersea—2, 4, 10, and 12, Octavia-st., 80 yrs., g.r. £24	1,110
Walworth—45, Townley-st., freehold	230
Peckham—1 and 2, Herne-grove, freehold	340
Clapham—12, Shelgate-rd., 70 yrs., g.r. £6	270
Blackfriars—14 to 20, Valentine-pl., 4½ yrs., g.r. £126	46
By Dowsett & Co.	
Old Kent-road—Nos. 572, 574, and 576, term 17 yrs., g.r. £13	960
Peckham—32 and 34, Frankton-rd., 70 yrs., g.r. £10	276
Caterham—"The Garlands," and 1a. 1r. 0p. freehold	1,300
By Newbon & Harding.	
Clapham—St. Stephen's-ter., "Royal Albert" tavern, 74 yrs., g.r. £7	1,400
19, 30, 47, and 49, Aldebert-ter., 74 yrs., g.r. £30	1,300
Caledonian-road—28, Twyford-st., 62 yrs., g.r. £6	240
Islington—33, Packington-st., 47 yrs., g.r. £7	535
Holloway—2, Upper Tollington-rd., 58 yrs., g.r. £6. 10s.	345
Stoke Newington—5, Harcombe-rd., 75 yrs., g.r. £5	235

March 15.—By Messrs. Elgood.

St. John's Wood, Acacia-road—Ground-rent of £18, term 46 yrs.	£335
Ground-rent of £84, 15s., term 46 yrs.	1,520

By Geo. Gouldsmith, Son, & Co.

Eaton-square—No. 45, term 28 years, g.r. £60	4,400

By J. J. Deverell.

Kentish-town—62, Dale-road, 75 yrs., g.r. £6	390
Tufnell Park—73, Huddleston-rd., 78 yrs., g r. £7.7s.	410
Beckenham, Kent House-rd.—Freehold residence, "Montrose"	550

MEETINGS.

Saturday, March 23.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." V. 3 p.m.

Edinburgh Architectural Association.—Visit to Midcalder Church and Calder House.

Monday, March 25.

Royal Institute of British Architects.—Mr. J. J. Stevenson, F.S.A., on "The Planning of Streets for Convenience and Architectural Effect." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. C. V. Boys, F.R.S., on "Instruments for the Measurement of Radiant Heat." I. 8 p.m.

Tuesday, March 26.

Institution of Civil Engineers.—Mr. C. E. Emery on "The District Distribution of Steam in the United States." 8 p.m.

Society of Arts (Foreign and Colonial Section).—Mr. R. Pritchett on "Borneo." 8 p.m.

Sanitary Institute (Lectures for Sanitary Inspectors).—Professor W. H. Corfield, M.A., on "Sanitary Appliances." 8 p.m.

Birmingham Architectural Association.—Mr. W. H. Kendrick and Mr. H. H. McConnal on "Old Woodwork."

Wednesday, March 27.

Inventors' Institute.—Mr. T. Glover Lyon, M.A., M.D., "On the Disinfection of Clothing, &c., by Steam and other Methods." 8 p.m.

Society of Arts.—Adjourned Discussion on Professor Kennedy's paper on "The Objects and Methods of the Society of Arts' Motor Trials." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8.30 p.m.

Thursday, March 28.

Royal Institution.—Professor J. H. Middleton, M.A., on "Houses and their Decoration, from the Classical to the Mediæval Period." II. 3 p.m.

Sanitary Institute.—Professor W. H. Corfield, M.A., on "House Sanitation from a Householder's Point of View." 5 p.m.

Society of Antiquaries.—8.30 p.m.

Society for the Encouragement of the Fine Arts.—Professor J. F. Hodgetts on "The Arts in the pre-Christian times amongst our forefathers in Scandinavia and in England." 8 p.m.

Friday, March 29.

Society of Arts (Indian Section).—Sir Juland Danvers on "The Progress of the Railways and Trade of India." 8 p.m.

Sanitary Institute (Lecture for Sanitary Inspectors).—Mr. C. E. Cassal on "Food (including Milk), Sale of Food and Drugs Act." 8 p.m.

Saturday, March 30.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Experimental Optics (Polarisation: Wave Theory)." VI. 3 p.m.

Miscellanea.

A New Club at Watford. — The new Watford Conservative and Constitutional Club was formally opened on Tuesday by the Marquis of Salisbury. The building occupies a prominent position at the corner of High-street and Clarendon-road. It is executed in red brickwork, with Monk's Park stone dressings, except in the gables, where buff-coloured terra cotta has been introduced. The edifice contains a hall 48 ft. by 28 ft. 6 in., reading and refreshment-rooms, two large billiard rooms, bar, card, chess, committee, and retiring rooms, with apartments for steward. Mr. T. Turner, of Watford, has carried out the works, from the designs of Mr. W. H. Syme, A.R.I.B.A.

Street Paving.—The use of indiarubber for street-paving has been brought forward by a German engineer, Herr Busse, of Linden, in Hanover. The material was first tried on the Goethe Bridge, 1,000 mètres in area, and, it appears, with the greatest success. In Berlin experiments with the new paving material are now being made in the Lützow-road, and other experiments are to be made in Hamburg. The new method is said to be particularly suited for bridges, inasmuch as it reduces the oscillation, but it is stated that the cost of such paving is somewhat higher than with other material.

New Board-school.—Plans for a new Board-school for the Clee-with-Weelsby School Board, to accommodate 1,000 children, have been approved by the Education Department, and will be proceeded with at once. Mr. E. W. Farebrother, of Grimsby, is the architect.

Registration of Plumbers in Leicestershire.—The Mayor of Leicester presided, on the 14th inst., at a large and representative public meeting held in the Wyggeston School, Leicester, for the purpose of electing a District Council to carry out in Leicestershire the National System of Registration and Training of Plumbers inaugurated by the Worshipful Company of Plumbers, London. Mr. Philip Wilkinson, architect (Past Master), and the Clerk (Mr. W. R. E. Coles), attended as a deputation from the Company. Among those who took an active part in the proceedings were several members of the Corporation of Leicester and of the medical and architectural professions. The Mayor, in opening the proceedings, said that the guild of Plumbers of London had done, and were doing, a good work in organising their system throughout the kingdom, and he thought it was an honour to Leicester to be selected as a centre. Mr. Philip Wilkinson explained that all plumbers who entered the trade since March, 1886, would have to undergo examination prior to being admitted to the Company's register. But those who were engaged in the trade previous to that date would be admitted upon production of their indentures of apprenticeship, or other satisfactory evidence of their competence. Messrs. Joseph Goddard and J. Tait, speaking for themselves and their brother architects, said they welcomed the system because it was of the utmost importance that architects should have conclusive proof of the efficiency of the plumbers whom they employ to carry out their work. Mr. Harrison, the President, and Mr. G. B. Cherry, the General Secretary of the United Operative Plumbers' Association of Great Britain and Ireland, were present, and the latter said that technical education of a practical kind was warmly welcomed by plumbers. He was convinced there was no lack of practical plumbers in each district. The men who brought discredit upon the trade were not plumbers at all. Examination and registration would enable the public to distinguish who were plumbers. Dr. Thompkins, Medical Officer of Health, said he saw no reason why the duty of supervising plumbing-work should not ultimately devolve upon the local Health Authorities, who already supervised the erection of houses and the laying down of drains. A resolution was unanimously passed approving the Company's system, and representatives of the master and operative plumbers and of the public were elected to act on the District Council. Among those elected to represent the public were the Mayor, the Chairman of the Sanitary Committee, the Chairman of the Leicester Technical School, the Medical Officer of Health, the Borough Surveyor, and the Engineer to the Water Department.

New Opera House at Christiania.—A new opera house and theatre is to be built at Christiania, but the committee having the scheme in hand has not yet decided whether this is to be exclusively a Norwegian or an international competition, half the members being in favour of the former and the other half in favour of the latter. The building is to be situated opposite the University, and close to the Royal Palace, on lands granted by the Government, for which reasons the designs for the building have to obtain the final approbation of King Oscar. The house is to cost about £35,000, exclusive of fitting-up, electric and heating installations, &c., and must offer accommodation for 1,500 persons. The area of the grounds is 2,500 square mètres. Two premiums are to be given for the best designs, one for £140 and one for £85. A jury of five members is to adjudicate upon the designs.

The Corinth Canal.—The work of cutting through the isthmus of Corinth is reported to suffer under the same financial difficulties as the Panama Canal work. A German technical journal states that when the subscription was opened for the carrying out of the scheme in 1882, estimated to cost thirty million francs, and to be finished in six years, the money was subscribed five times over. In 1887, however, this sum had been expended, and a further sum of thirty million francs was invited. However, up to the present only a third of this sum has been obtained, and if no further funds can be obtained the work on the canal will soon have to be stopped. Hitherto about two-thirds of the earthworks have been executed, but there still remains a great deal to be done, and it is now stated that as the canal will cost twice as much as originally estimated, no profits can be anticipated.

The English Iron Trade.—The tendency in the English iron market is still upwards, notwithstanding various adverse influences, such as the nearness of the quarterly meetings, uncertainty as to cost of raw materials and labour, and the crash in the copper trade. There is a firm feeling in pig-iron. The Glasgow warrant market has been quite as active as during the last two or three weeks, and although prices of warrants have changed but little, Scotch makers are still advancing their quotations. Cleveland iron is also 6d. a ton higher, and Bessemer iron in the north-west is about the same as last week. Pig-iron is strong in other districts, and rising in value. Manufactured iron is somewhat quieter in England, but in Scotland there continues an excellent demand. Notwithstanding the comparatively slower state of trade, in the North of England finished iron is about 2s. 6d. a ton dearer this week, and prospective advances are spoken of in Scotland. Tinplates are improving in demand, and large orders are reported to be in the market, which are delayed owing to the uncertainty with regard to raw material and wages. Steel is in undiminished heavy consumption, and prices are very stiff. As much as 4*l*. 12s. 6d. is asked for heavy rails in the North. In ship-building an accession of fresh orders has to be noted, but some owners are holding back on account of the great increase in the cost of tonnage. Engineers continue very busy.—*Iron.*

Metal Works for Sale.—The Burry Port Lead and Silver Works, in Carmarthenshire, and the Briton Ferry Ironworks, in Glamorganshire, will shortly be put up for sale, by auction, at the Mart. The ironworks, until lately in operation, cover a total area exceeding 17 acres, on the river Neath, and are stated to be capable of turning out 600 tons of manufactured iron weekly. The property is held under three leases of ninety-nine years, from January, 1847, at ground-rents of 515*l*. per annum in all, with way-leaves and other dues; these may be consolidated into one fresh lease for ninety-nine years. Intersected by lines in communication with the Great Western Railway, the works lie near to the Rhondda and Swansea Bay Railway, which, when completed, will afford ready access to the South Welsh coal and ironstone districts. The Burry Port Works are said to be equal to about 200 tons of lead per week, and have plant for the extraction of silver. They extend over about 23½ acres, situated on the Bristol Channel. The property for sale includes a row of twenty cottages, and a chapel, a foundry, and a freehold ground-rent of 111*l*. 5s. per annum, derived from Messrs. Risley & Burgmann's adjoining white-lead works.

Elastic Sandstone.—What is known as itacolumite, or elastic sandstone, is found in California, Georgia, and other localities in the United States, and a whole mountain of it, it is stated, exists in Southern Nevada, a short distance east of Death Valley. Itacolumite is nearly always to be met with in regions producing the diamond, and is the reputed matrix of that gem. A piece of this elastic sandstone, about 6 in. long, 1 in. wide, and ¼ in. thick, is in the possession of the *Mining and Scientific Press* (San Francisco), which is as flexible as a piece of india-rubber. Another piece, 13 in. long, 2½ in. wide, and ½ in. thick, is in the office of the acting chief clerk of the United States War Department, Washington, and said to possess equal flexibility, but being, without doubt, a genuine stone. No practical use has as yet been made of the stone, but it would appear to be useful for elastic foundations for machinery, to prevent vibration, such as are now being introduced in America. At any rate, it is a geological curiosity.

An Elastic Wheel.—A wheel has been patented by Mr. James Arnott, in which the spokes are inserted into a circular cushion of india-rubber in a groove round the nave of the wheel, with holes for the insertion of the spokes, which, however, are made with a shoulder bearing on the surface of the india-rubber. It is claimed that this produces practically an elastic wheel, lessening the wear and jar at the junction of the spokes with the nave, and rendering the running smoother.

Messrs. Perry & Co.'s Staff.—On Saturday evening last the in and outdoor staff of Messrs. Perry & Co., builders, Bow, held their annual smoking concert at Winchester House, Old Broad-street, E.C., with Mr. H. H. Bartlett in the chair. About 450 invitations were accepted, and a very pleasant evening was spent.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	10	0
Teak, E.I. ....load	10	0	0	13	0	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada ....load	3	10	0	5	0	0
Birch "	3	10	0	6	0	0
Elm "	4	0	0	5	0	0
Fir, Dantsic, &c.	2	0	0	4	0	0
Oak "	2	10	0	4	10	0
Canada	5	10	0	7	10	0
Pine, Canada red	3	5	0	4	0	0
" yellow	3	10	0	5	10	0
Lath, Dantsic ....fathom	4	10	0	5	10	0
St. Petersburg	5	0	0	6	10	0
Wainscot, Riga, &c. ....log	2	15	0	4	5	0
" Odessa, crown	0	0	0	0	0	0
Deals, Finland, 2nd and 1st ...std. 100	9	10	0	11	0	0
" " 4th and 3rd	8	0	0	9	0	0
Riga	7	10	0	9	0	0
St. Petersburg, 1st yellow	11	10	0	15	0	0
" 2nd "	10	0	0	11	0	0
" white	8	10	0	10	10	0
Swedish	9	0	0	16	0	0
White Sea	9	10	0	17	0	0
Canada, Pine, 1st	16	0	0	26	10	0
" " 2nd	11	0	0	17	10	0
" " 3rd, &c.	8	0	0	10	10	0
" Spruce, 1st	9	10	0	11	0	0
" " 3rd and 2nd	7	10	0	9	10	0
New Brunswick, &c.	6	15	0	8	15	0
Battens, all kinds	6	10	0	20	0	0
Flooring Boards, sq., 1 in., prepared, First	0	11	0	0	14	6
Second	0	8	0	0	10	9
Other qualities	0	5	6	0	7	9
Cedar, Cuba ....foot	0	0	4½	0	0	4½
Honduras, &c.	0	0	4	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average	0	0	4½	0	0	6½
Mexican "	0	0	4½	0	0	5½
Tobasco "	0	0	5½	0	0	6½

TIMBER (continued).	£.	s.	d.	£.	s.	d.
Mahogany, Honduras, cargo average	0	0	5½	0	0	6½
Box, Turkey ....ton	4	0	0	12	0	0
Rose, Rio	15	0	0	20	0	0
Bahia	14	0	0	18	0	0
Satin, St. Domingo ....foot	0	0	6	0	1	3
Porto Rico	0	0	9	0	1	3
Walnut, Italian	0	0	4½	0	0	6½
METALS.						
IRON—Bar, Welsh, in London...ton	5	5	0	5	10	0
" " at works in Wales ...	4	15	0	5	0	0
" Staffordshire, in London ...	5	10	0	6	10	0
COPPER—						
British, cake and ingot ....ton	0	0	0	0	0	0
Best selected	46	0	0	48	0	0
Australian	0	0	0	0	0	0
Chili, bars	39	0	0	41	0	0
YELLOW METAL ....lb.	0	0	0	0	0	0
LEAD—Pig, Spanish ....ton	0	0	0	0	0	0
English, common brands	0	0	0	0	0	0
Sheet, English	0	0	0	0	0	0
SPELTER—						
Silesian, special ....ton	17	5	0	17	7	6
Ordinary brands	17	2	6	17	5	0
TIN—						
Straits	93	0	0	0	0	0
Australian	93	15	0	0	0	0
English Ingots	96	0	0	0	0	0
ZINC—English sheet ....ton	21	0	0	22	0	0
OILS.						
Linseed ....ton	18	2	6	18	7	6
Cocoanut, Cochin	27	0	0	28	0	0
Ceylon	25	10	0	25	15	0
Palm, Lagos	23	10	0	0	0	0
Rapeseed, English pale	28	0	0	28	10	0
" brown	26	15	0	27	0	0
Cottonseed, refined	23	10	0	0	0	0
Tallow and Oleine	19	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
" refined	7	0	0	12	0	0
TAR—Stockholm ....barrel	1	2	0	1	2	6
Archangel	0	14	0	0	14	6

COMPETITION AND CONTRACTS.

Epitome of Advertisements in this Number.

COMPETITION.

Nature of Work.	By whom Required.	Premium.	Designs to be delivered.	Page.
Hotel, Shops, and Premises, Newtwn, N. Wales	....	25*l*.	Not stated.	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
General Paving Works	West Ham Council	Lewis Angell	Mar. 26th	xi.
Broken Guernsey Granite	do.	do.	do.	xi.
Stores and Works	Reading Corporation	A. W. Parry	Mar. 28th	xi.
Broken Granite and Stone Slags	Ramsey Local Board	*Official*	Mar. 29th	xii.
Battery, Tenby	Admiralty	do.	do.	ii.
Limestone Footway Pavements	Birmingham Public Works Committee	W. S. Till	Mar. 30th	ii.
New Road and Culvert, Windsor	....	T. V. H. Davison	do.	xii.
Brick Sewer, &c.	Paddington Vestry	*Official*	April 1st	ii.
Making-up Roads	Finchley Local Board	G. W. Brumell	do.	xi.
Works and Materials	do.	do.	do.	xi.
Shops and Stabling, Hampstead	....	E. Monson, Jun.	April 2nd	xi.
Removal of Road Sweepings & Road Watering	Hackney Bd. of Works	J. Lovegrove	do.	xi.
Kerbing, Tarpaving, Metalling, &c.	Lewisham Bd. of Wks.	*Official*	do.	xi.
Surface Waterworks	Wimbledon Local Bd	W. Santo Crimp	do.	xi.
Pipe Sewers	Hanwell Local Board	R. J. W. Herbert	April 3rd	xii.
Sewerage Works	Chiswick Local Board	A. Ramsden	do.	xi.
Roadmaking, Paving, Sewers, &c.	Fulham Vestry	J. P. Norrington	do.	xi.
Infirmary, &c.	Dartford Local Board	G. H. Tait	April 5th	xii.
Electric Fire Signal System	Met. Asylums Board	A. & C. Harston	April 8th	ii.
Fire Extinction Appliances	do.	do.	do.	ii.
Valves, Sluices, &c.	Manchester Corporation	G. H. Hill	April 9th	xi.
New Steel Bridge, &c.	Portland Ferry Bridge Commissioners	Sir John Coode	April 13th	xii.
Glazed Stoneware Sewer Pipes, &c.	Bath U.S.A.	C. R. Fortune	April 15th	ii.
Cemetery Buildings, &c.	Sutton (Surrey) L. Bd.	*Official*	April 17th	xi.
Purchase and Pulling down of Building Mat.	School Bd. for London	do.	Not stated.	xii.
Pulling Down and Clearing Houses, Deptford	....	C. Bell	do.	xii.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

BURSLEM.—For the erection of new printing works for Mr. W. Savage. Mr. A. R. Wood, architect, Tunstall. Quantities supplied:—

J. J. Longden, Burslem	£1,199	0	0
T. Critchlow, Burslem	1,146	0	0
C. Cornes, Hanley	1,145	0	0
Cooper & Jones, Tunstall	1,085	0	0
Yorke & Goodwin, Tunstall	1,073	0	0
J. Bowden, Burslem	1,050	0	0
W. Grant, Burslem	1,050	0	0
C. Cope, Tunstall	995	0	0
W. Cooke, Burslem (accepted)	991	0	0

BURSLEM.—For additions and alterations to Hill Top Chapel. Mr. A. R. Wood, architect, Tunstall. Quantities supplied:—

Contract No. 1.—Alterations to School.

W. Grant, Burslem (accepted)	£750	0	0

Contract No. 2.—New Vestries and Balcony.

W. Cooke, Burslem	£593	0	0
W. Grant, Burslem (accepted)	510	0	0
C. Cope, Tunstall	503	0	0

CLOONACANNANA (Co. Mayo, Ireland).—For the erection of Cloonacannana Bridge, for the Grand Jury of the County of Mayo. Mr. Wm. Patterson Orchard, B.E., County Surveyor North Mayo, engineer:—

John Cunningham, 3, Lombard-street, Dublin	£3,338	15	9
James Goodwin & Co., Motherwell, near Glasgow	2,664	12	8
Alexander Finlay & Co., Motherwell, near Glasgow (accepted)	2,259	14	6

COLCHESTER.—For pulling down and rebuilding new stables and laundry at the "Red Lion" Hotel, for Messrs. Daniell & Sons' Breweries, Limited. Mr. J. W. Start, architect, High-street, Colchester:—

C. Shephard	£733	0	0
C. Oldridge	730	0	0
Grimwood & Sons	695	0	0
T. J. Ward	650	0	0
A. Chambers	639	0	0
W. Shead, jun.	584	0	0
G. Dobson	577	0	0
F. Dupont (accepted)	567	0	0
A. Diss	550	0	0

CROYDON.—For the erection of two detached villa-residences, Camden-road, Crohamhurst, Croydon. Mr. E. C. Homer, architect, 99, Gresham-street, E.C.:—

A. Nash (accepted)	£2,2[illegible]6	0	0

DEAL (Kent).—For alterations and repairs to five houses, Prince of Wales-terrace, Deal, for the Conservative Land Society, 33, Norfolk-street, Strand, W.C.:—

W. & S. Denne, Upper Walmer	£778	0	0
W. Scowen, Islington	769	0	0
R. Cox, Battersea	724	0	0
W. Martin, Ramsgate	648	8	0
W. H. Brown, Deal	639	6	0
Hayward & Paramor, Folkestone	636	0	0
Jas. J. Wise, Deal	598	0	0
T. & W. Chandler, Deal	596	7	6
Denne & Son, Deal	547	0	0
Ford & Kirrage, Upper Holloway*	450	0	0

* Accepted.

DOWNTON.—For erecting farm buildings at Downton. Mr. W. Charles Evans, architect, 3a, Poet's-corner, Westminster:—

Gregory & Hudson, London	£1,087	0	0
Stevens Bros., Southampton	971	0	0
Rushley Bros., Lymington	945	0	0
G. Bevan, Bournemouth (accepted)	897	0	0

HANWELL.—For the construction of new effluent water and subsiding tanks, the formation of sludge-beds, &c., and alterations to the present works, for the Hanwell Local Board, at their sewage outfall works. Mr. R. J. W. Herbert, Surveyor to the Hanwell Local Board:—

B. Cooke & Co.	£809	15	0
J. Mackay	784	5	11
J. G. Potter	769	0	0
A. Kellett	759	2	5
W. Cunliffe	728	12	6
W. Parker	723	0	0
G. Bell	714	0	0
A. & B. Hanson	677	14	9
G. Gibson (accepted)	626	17	7

[Surveyor's estimate, £691. 8s. 2d.]

LONDON.—For erecting All Saints' Church, West Dulwich. Mr. Geo. H. Fellowes Prynne, architect, 10, Torrington-square, London. Quantities supplied by Mr. R. Henry Hale, 6, Duke-street, Strand:—

Kirk & Randall, London	£23,143		
Mark Martin, Eastbourne	20,200	0	0
Abley, Salisbury	20,112	0	0
Perry & Co., London	20,068	0	0
Joseph Martin, Eastbourne	19,977	0	0
Kynoch & Co., London	19,595	0	0
Dove Bros., London	19,409	0	0
Bull & Son, Southampton	18,985	0	0
Bowyer Bros., Norwood	18,930	0	0
Goddard & Son, Farnham	18,909	0	0
Rowse, Plymouth	14,987	0	0
Revised Tenders asked from the last four-named firms.			
Rowse	17,995	0	0
Bull & Sons	17,750	0	0
Goddard & Son	17,619	0	0
Bowyer Bros.*	17,544	0	0

* Tender for eastern portion of work accepted conditionally.

LONDON.—For roads and sewers at the Broomwood Park Estate, Wandsworth Common. Mr. W. Newton Dunn, architect and surveyor, Bucklersbury:—

Treherne & Co.	£2,985	0	0
Hayter	2,760	0	0
Wilson	2,530	0	0
Bell	2,148	0	0
James Neal	2,034	0	0
Adam	1,992	12	0
Iles	1,990	17	6
Peill & Sons	1,943	0	0
Nicholls	1,921	9	0
Blackmore	1,680	0	0
George Neal & Co., Limited*	1,673	12	6
Saunders	1,659	7	0

* Accepted.

LONDON.—For rebuilding No. 18, Langham-st., W.:—

Colls & Son	£2,795	0	0
Holliday & Greenwood	2,612	0	0
Stevenson	2,596	0	0
Lawrence	2,583	0	0
Downs	2,534	0	0
Brickell	2,395	0	0
Green & Lee (accepted)	2,348	0	0

LONDON.—For additions and alterations to premises at 291, Lyham-road, Brixton-hill, S.W., for the East Surrey Co-operative Society, Limited:—

Fitness Bros.	£330	0	0
Lyne & Smith	230	0	0
H. Bristow	230	0	0
Young & Lonsdale	230	0	0
Garrett & Son (accepted)	185	0	0

LONDON.—For building billiard-rooms, &c., at the "Rifle Volunteer" public-house, High-road, Kilburn, for Mr. Thos. Goddard. Mr. Joseph G. Needham, architect, 11, Powerscroft-road, Lower Clapton, N.E.:—

Williams & Son	£1,249	0	0
H. B. Oldrey	938	0	0
G. Mower	798	0	0
S. Barnett	795	0	0
E. Canington	745	0	0

LONDON.—For alterations to the "Postman's Knock" beer-house, Cambridge-heath, E. Mr. Joseph G. Needham, architect, 11, Powerscroft-rd., Lower Clapton, N.E.:

Coulsell Bros.	£247	0	0
J. & F. Bane	233	0	0
S. W. Hawkings	219	0	0

LONDON.—For alterations and additions to the Branch School (Marlesford Lodge), Hammersmith, for the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

Simmonds Bros.	£532	0	0
G. Godson	490	0	0
H. Haynes	479	0	0
R. Cox	430	0	0
Flew & Co., 5, West Kensington-terrace, W. (accepted)	400	0	0

LONDON.—For the enlargement of the Netherwood-street School, Kilburn, by 596 places, for the School Board for London. Mr. T. J. Bailey, architect:—

Atherton & Latta	£8,174
Stimpson & Co.	7,730
Hart Bros.	7,691
H. L. Holloway	7,636
Caplen & Redgrave*	7,097

* Amended tender, £6,772, recommended by the Works Committee for acceptance.

LONDON.—For erecting a boundary-wall on the south-west side of the Tooting Graveney site, for the School Board for London. Mr. T. J. Bailey, architect:—

J. J. Richards	£[illegible]33	0	0
King Brothers & Co.	171	0	0
A. M. Deacon*	154	0	0

* Recommended by the Works Committee for acceptance.

LONDON.—For alterations and additions to the "Bagnigge Wells" public-house, for Messrs. Bacon Bros., King's-Cross-road. Mr. Charles Young, architect, 70, Finsbury-pavement, E.C.:—

Patman & Fotheringham	£3,187	0	0
Drew & Cadman	2,893	0	0
Godfrey	2,779	0	0
Burman & Son	2,675	0	0
Downs	2,643	0	0
Mower & Son	2,589	0	0
Veal	2,395	0	0

LONDON.—For external repairs to the Infirmary Buildings, &c., Cale-street, Chelsea, for the Chelsea Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

G. Searle, Chelsea (accepted)	£475	0	0

MARCH (Cambs.).—For alterations and additions to shop and premises at No. 4, High-street, for Mr. Edward C. Haylock. Mr. William A. Burr, architect, 65, Chancery-lane, W.C.:—

Swann	£425	0	0
Collingwood & Son	332	0	0
Whittlesey	333	9	6
Ward (accepted)	290	19	0

[All of March.]

MILFORD-ON-SEA (Hants).—For the erection of Downton House. Mr. W. Charles Evans, architect, 3a, Poet's-corner, Westminster:—

Rashley Bros., Lymington, Hants*	£774	0	0

* Accepted.

ST. LEONARD'S-ON-SEA.—For shop-front and studio at 61, Bohemia-road, St. Leonard's-on-Sea, for Mr. S. Perrett. Mr. Julian Downsborough, architect, Bexhill-on-Sea:—

Foster & Phillips, Hastings	£222	10	0
C. Hughes, Bexhill	207	0	0
A. H. White, St. Leonard's	194	15	0
Alfred Ashdown, St. Leonard's	164	0	0
H. Russell, Beckley	157	0	0
H. T. Squirrell, Bexhill	151	0	0
F. J. Cruttenden, St. Leonard's*	147	0	0

* Accepted.

SYDENHAM.—For completion of house at Sydenham:

F. Carter, Brady Works, Bethnal Green (accepted)	£300	0	0

[No competition.]

TOTTENHAM.—For the erection of temporary iron school buildings, play-grounds, &c., for the Tottenham School Board. Mr. Charles Bell, architect, 3, Salter's Hall-court, E.C. Quantities by Messrs. D. Campbell & Son, 69, Finsbury-pavement, E.C.:—

	Schools, &c.			Fittings.		
Ewart & Co.	£2,157	0	0	£280	0	0
J. Kellaway	1,886	0	0	244	0	0
J. Linzell	1,845	0	0	216	0	0
E. Spencer & Co.	1,728	0	0	266	10	0
Croggon & Co.	1,485	0	0	250	0	0
C. Wall	1,393	0	0	194	0	0
H. Knight & Son	1,383	0	0	199	0	0
W. Harbrow	1,329	10	0	212	6	0
D. Crowe, 27, Highgate-road*	1,161	0	0	—		

*Accepted.

TUNSTALL.—For the erection of a group of buildings, comprising Science and Art School, Free Library, Public Baths, Fire Engine Station, and Town Yard Buildings. Mr. A. R. Wood, architect, Tunstall:—

Cooper & Jones, Tunstall	£10,137	0	0
Cooke, Burslem	9,985	0	0
Bradney & Co., Wolverhampton	9,795	0	0
Grosvenor, Tunstall	9,455	0	0
Cope, Tunstall	9,388	0	0
Smith, Tunstall	9,160	0	0
Bowden, Burslem	9,075	0	0
Walkerdine, Derby	8,990	0	0
Goodwin & Yorke, Tunstall*	8,952	0	0

*Accepted.

TUNSTALL.—For the erection of a seven-oven manufactory, at Brownhills. Mr. A. R. Wood, architect, Tunstall. Quantities supplied:—

Cooper & Jones, Tunstall	£10,552	0	0
C. Smith, Tunstall	10,217	0	0
J. Yorke, Tunstall	10,000	0	0
N. Barlow, Stoke-on-Trent	9,930	0	0
J. Bowden, Burslem	9,800	0	0
W. Cooke, Burslem	9,711	0	0
C. Cornes, Hanley	9,075	0	0
C. Cope, Tunstall	9,038	0	0
J. Procter, Tunstall (accepted)	9,000	0	0
For Engine, Boilers, and other Machinery.			
Hartley, Arnoux & Fanning, Stoke-on-Trent (accepted)	1,940	0	0

TWICKENHAM.—For forming new road at Twickenham, Middlesex, sewered and kerbed. Mr. Herbert E. Saunders, architect and surveyor, 18, Walbrook, London, E.C.:—

C. Killingback, Camden Town	£1,192	0	0
S. Atkins, Kingston	790	0	0
G. Neal & Co., Wandsworth	769	0	0
F. W. Milman, New Cross	683	0	0
Woodham & Fry, Greenwich	609	0	0

THAME (Oxon).—For the erection of new premises for the Bucks and Oxon Union Bank, Limited. Mr. Charles P. Ayres, architect, 52, High-street, Watford:—

T. Turner, Limited, Watford	£3,287	0	0
Orchard & Son, Banbury	3,194	0	0
T. H. Kingerlee, Oxford (accepted)	3,087	0	0

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Addressed to No. 46, Catherine-street, W.C.

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READING CASES, { Now ready. NINEPENCE EACH. By post (carefully packed), 1s.

TO CORRESPONDENTS.

C. S.—"Build well."—(Very good morality, no doubt, but not very good poetry. If we go out of our way to print verses, they must at all events be good ones).—W. F. P.—(The question of locale is only a matter for the society—not of public interest).—C. and S. —S. J. N.—(Drawing received).—C. N.—(Your question is unintelligible, as you do not say on whose part the liability is supposed to be incurred).—E. A. H.—J. E. M.—H. P. A.—(Thanks.)—E. H. L.—O. P. (shall have attention).—C. A. W.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, graneries, tun-rooms, and terraces. [ADVT.

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Seyssel, Patent Metallic Lava, and White Asphaltes.
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Oak, 1 inch Parquet Floors, laid and polished, from £7. 10s. a square.
Solid 1-inch Oak, straight boards, laid and polished, at £6. 18s. a square.
Solid ½-inch Oak Parquet for covering Deal floors, laid and polished, from £5 a square.
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Tender for Contracts for any Joiners' work, or Ornamental Plaster. Painting, Plain or Decorative. Wrought-Iron Work. Stained Cathedral Glass, and any other Interior Work.

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